

V9881
REPORT NOS. 208-TRC-93-013

212-TRC-93-013

301-TRC-93-013

VEHICLE SAFETY COMPLIANCE TESTING
FOR OCCUPANT CRASH PROTECTION,
WINDSHIELD MOUNTING, WINDSHIELD ZONE
INTRUSION, AND FUEL SYSTEM INTEGRITY

TOYOTA MOTOR CORPORATION

1993 TOYOTA T100 PICKUP

NHTSA NO. CP5106

TRC TEST NO. 930224

TRANSPORTATION RESEARCH CENTER INC.

10820 STATE ROUTE 347

EAST LIBERTY, OHIO 43319



FEBRUARY 12, 1993

FINAL REPORT

PREPARED FOR:

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF VEHICLE SAFETY COMPLIANCE (NEF-31)
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16. Abstract A 30 mph flat frontal barrier impact test was conducted on a 1993 Toyota T100 pickup, NHTSA No. CP5106, at Transportation Research Center Inc. on February 24, 1993. This test was conducted to determine compliance with Federal Motor Vehicle Safety Standards: FMVSS 208, "Occupant Crash Protection"; FMVSS 212, "Windshield Mounting"; FMVSS 219 (partial), "Windshield Zone Intrusion"; FMVSS 301, "Fuel System Integrity." The barrier impact velocity was 29.3 mph. The vehicle's maximum static crush was 18.1 inches. The ambient temperature was 70° F. The driver's head injury criteria (HIC) was 484. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 36.9 g. The driver's left and right femur maximum axial forces were 409 pounds and 477 pounds, respectively. The passenger's head injury criteria (HIC) was 281. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 33.3 g. The passenger's left and right femur maximum axial forces were 433 pounds and 402 pounds, respectively. The vehicle appears to comply with the applicable requirements of FMVSS 208, 212, 219 (partial), and 301.					
17. Key Words Frontal Impact 30 mph Vehicle Safety Compliance Testing: FMVSS 208, "Occupant Crash Protection" FMVSS 212, "Windshield Mounting" FMVSS 219P, "Windshield Zone Intrusion" FMVSS 301, "Fuel System Integrity"			18. Distribution Statement Available from: NHTSA Technical Reference Division Room 5108, (NAD-52) 400 Seventh Street, SW Washington, DC 20590 Attn: Mr. Robert Hornickie		
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METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
in	inches	2.5	centimeters	cm
ft	feet	30	meters	m
yd	yards	0.9	kilometers	km
mi	miles	1.6		
AREA				
in ²	square inches	6.5	square centimeters	cm ²
ft ²	square feet	0.09	square meters	m ²
yd ²	square yards	0.8	square meters	m ²
mi ²	square miles	2.6	square kilometers	km ²
	acres	0.4	hectares	ha
MASS (weight)				
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
VOLUME				
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft ³	cubic feet	0.03	cubic meters	m ³
yd ³	cubic yards	0.76	cubic meters	m ³
TEMPERATURE (exact)				
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

* 1 m = 2.54 exactly. For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price \$2.25, SO Catalog No. C13.10-286.

Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
km	kilometers	1.1	yards	yd
		0.6	miles	mi
AREA				
cm ²	square centimeters	0.16	square inches	in ²
m ²	square meters	1.2	square yards	yd ²
km ²	square kilometers	0.4	square miles	mi ²
ha	hectares (10,000 m ²)	2.5	acres	
MASS (weight)				
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
VOLUME				
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m ³	cubic meters	35	cubic feet	ft ³
m ³	cubic meters	1.3	cubic yards	yd ³
TEMPERATURE (exact)				
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F

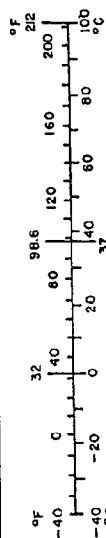


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SECTION 1.0

PURPOSE & TEST PROCEDURE

PURPOSE

This 30 mph flat frontal barrier impact test is part of the Federal Motor Vehicle Safety Standard (FMVSS) 208, 212, 219 (partial), and 301 compliance test program conducted for the National Highway Traffic Safety Administration (NHTSA) by Transportation Research Center Inc. (TRC) under Contract No. DTNH22-90-C-21003. The purpose of this test was to determine if the subject vehicle, a 1993 Toyota T100 pickup, NHTSA No. CP5106, meets the performance requirements of FMVSS 208, "Occupant Crash Protection"; FMVSS 212, "Windshield Mounting"; FMVSS 219 (partial), "Windshield Zone Intrusion"; and FMVSS 301, "Fuel System Integrity," in the flat frontal barrier impact mode.

TEST PROCEDURE

This test was conducted in accordance with NHTSA's Office of Vehicle Safety Compliance (OVSC) Laboratory Test Procedure No. TP-208-08. Data was obtained relative to FMVSS 208, "Occupant Crash Protection"; FMVSS 212, "Windshield Mounting"; FMVSS 219 (partial), "Windshield Zone Intrusion"; and FMVSS 301, "Fuel System Integrity," performance.

The test vehicle was instrumented with seven (7) accelerometers to measure longitudinal axis accelerations. The vehicle's specified impact velocity range was 28.9 to 29.9 mph. The vehicle impacted a flat frontal barrier.

The test vehicle contained two (2) Part 572 B 50th percentile adult male anthropomorphic test devices (dummies). The dummies were positioned in the front outboard designated seating positions according to the dummy placement procedure specified in Appendices B and C of the Laboratory Test Procedure.

Both dummies were instrumented with head and chest accelerometers to measure longitudinal, lateral, and vertical accelerations, and with left and right femur load cells to measure axial forces.

The twenty-three (23) data channels were multiplexed and recorded on a 14-track tape drive. The data was digitally sampled at 8000 samples per second and processed per sections 12.8 and 12.9 of the Laboratory Test Procedure.

The crash event was recorded by one (1) real-time panning motion picture camera and fourteen (14) high-speed motion picture cameras. The pre-test and post-test conditions were recorded by one (1) real-time motion picture camera.

The vehicle and occupant data are summarized in Section 2.0. The FMVSS 208, 212, 219 (partial) and 301 data are presented in Section 3.0. The vehicle, occupant, and camera measurements are presented in Section 4.0. Appendix A contains the still photographic prints. Appendix B contains the dummy and vehicle data plots.

SECTION 2.0

FRONTAL BARRIER IMPACT TEST SUMMARY

TEST RESULTS SUMMARY

This flat frontal barrier test was conducted at TRC on February 24, 1993.

The test vehicle, a 1993 Toyota T100 pickup, NHTSA No. CP5106, appeared to comply with the performance requirements of FMVSS 208, 212, 219 (partial), and 301 in the flat frontal barrier impact mode. The Head Injury Criteria (HIC) calculations were less than 1000, the chest resultant accelerations did not exceed 60 g's, and the axial forces transmitted through the upper legs did not exceed 2,250 pounds as measured by Part 572 B dummies seated in the front outboard designated seating positions. The vehicle's restraint system met the applicable comfort and convenience requirements. The windshield periphery retention was 100 percent. There was no penetration into any portion of the windshield. No fluid spilled from the vehicle's fuel system following the impact or during the static rollover test.

The test vehicle was equipped with a 3.0 liter, inline engine, manual transmission, power steering, and power brakes. The vehicle's test weight was 3943 pounds. The vehicle's impact speed was 29.3 mph. The vehicle's maximum static crush was 18.1 inches.

The driver's head injury criteria (HIC) was 484. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 36.9 g. The driver's left and right femur maximum axial forces were 409 pounds and 477 pounds, respectively.

The right front passenger's HIC was 281. The right front passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 33.3 g. The right front passenger's left and right femur maximum axial forces were 433 pounds and 402 pounds, respectively.

There was no loss of windshield periphery retention.

There was no penetration through the windshield.

Following the impact, no fluid spilled from the vehicle's fuel system prior to the static rollover test or during any portion of the static rollover test.

DATA ACQUISITION EXPLANATIONS

The driver's chest Y-axis accelerometer, CSTYG1, recorded questionable data spikes at 64 and 84 milliseconds. The data acquisition circuits were checked immediately after the impact. All appeared normal. The cause of the spikes could not be identified.

TABLE 1 CRASH TEST SUMMARY

NHTSA NO.: CP5106 TEST TYPE: Frontal Barrier Impact

TEST DATE: 02/24/93 TEST TIME: 1519 AMBIENT TEMP. (°F): 70

VEHICLE YEAR/MAKE/MODEL/BODY STYLE: 1993/Toyota/T100/pickup

VEHICLE TEST WEIGHT (LBS): 3943

IMPACT ANGLE (DEG)*: 0

IMPACT VELOCITY (MPH)**: PRIMARY = 29.3 SECONDARY = 29.3

MAXIMUM STATIC CRUSH (IN): 18.1

AVERAGE REBOUND (IN): 10.2

DUMMIES: Driver #354 Passenger #1173

TYPE: Part 572 B Part 572 B

LOCATION: Left front Right front

RESTRAINT: 3-point unbelt 3-point unbelt

NUMBER OF DATA CHANNELS: 23

NUMBER OF CAMERAS: HIGH-SPEED 14 REAL-TIME 2

*With respect to tow track centerline.
**Speed trap measurement ($\pm$.05 mph accuracy)

TABLE 2 TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Toyota Motor Corporation

MAKE/MODEL: Toyota/T100

VIN: JT4VD10A6P0006145

BODY STYLE: pickup

MODEL YEAR: 1993

NHTSA NO.: CP5106

COLOR: Red

ENGINE DATA: TYPE: inline CYLINDERS: 6 DISPLACEMENT: 3.0 liter

TRANSMISSION DATA: 5 SPEED, X MANUAL, ___AUTOMATIC, ___FWD, X RWD, ___4WD

DATE VEHICLE RECEIVED: 01/26/93

ODOMETER READING: 74

DEALER'S NAME AND ADDRESS: Germain Toyota of Columbus
5777 Scarborough Blvd.
Columbus, OH 43232

ACCESSORIES:

POWER STEERING	Yes	AUTOMATIC TRANSMISSION	No
POWER BRAKES	Yes	AUTOMATIC SPEED CONTROL	No
POWER SEATS	No	TILTING STEERING WHEEL	No
POWER WINDOWS	No	TELESCOPING STEERING WHEEL	No
TINTED GLASS	Yes	AIR CONDITIONING	No
RADIO	Yes	ANTI-SKID BRAKE	Yes rear only
CLOCK	Yes	REAR WINDOW DEFROSTER	No
OTHER	None		

REMARKS:

1. IS THE VEHICLE STOCK THROUGHOUT? Yes
2. DOES VEHICLE SHOW EVIDENCE OF PRIOR ACCIDENT HISTORY? No
3. DOES VEHICLE SHOW ANY SIGNIFICANT CORROSION? No
4. CONDITION OF THE FRONT/REAR BUMPER AND FRAME: Good

CERTIFICATION DATA FROM VEHICLE'S LABEL:

VEHICLE MANUFACTURED BY: Toyota Motor Corporation

DATE OF MANUFACTURE: 11/92

VIN: JT4VD10A6P0006145

GVWR: 5000 LBS

GAWR: FRONT: 2250 LBS., REAR: 3090 LBS.

TABLE 2 TEST VEHICLE INFORMATION CONT'D

TIRES ON VEHICLE (MFR., LINE, SIZE): Bridgestone, SF-408, P235/75R15

TIRE PRESSURE WITH MAXIMUM CAPACITY VEHICLE LOAD: FRONT: 35 PSI
REAR: 35 PSI

SPARE TIRE (MFR., LINE, SIZE): Bridgestone, SF-408, P235/75R15

TYPE OF SEATS: FRONT: Bench
REAR: None

TYPE OF FRONT SEAT BACKS: Non-adjustable

MAXIMUM WIDTH: 75.8 INCHES

WHEELBASE: 121.9 INCHES

LOCATION OF LABEL STATING TIRE & CAPACITY DATA:

The label was located on the driver's side B-pillar.

TIRE & CAPACITY DATA FROM VEHICLE'S LABEL:

RECOMMENDED TIRE SIZE: P215/75R15

RECOMMENDED COLD TIRE PRESSURE: FRONT: 26 PSI; REAR: 35 PSI

DESIGNATED SEATING CAPACITY: NA FRONT NA REAR NA TOTAL

VEHICLE CAPACITY WEIGHT: NA LBS.

TEST VEHICLE ATTITUDE (ALL MEASUREMENTS ARE IN INCHES):

DELIVERED ATTITUDE: LF 32.6; RF 32.2; LR 33.2; RR 32.8

FULLY LOADED ATTITUDE: LF 32.4; RF 31.9; LR 31.6; RR 31.4

PRE-TEST ATTITUDE: LF 32.2; RF 31.8; LR 31.6; RR 30.9

POST-TEST ATTITUDE: LF 31.8; RF 30.8; LR 31.4; RR 30.9

TABLE 2 TEST VEHICLE INFORMATION CONT'D

WEIGHT OF TEST VEHICLE AS RECEIVED (WITH MAXIMUM FLUIDS):

RIGHT FRONT	966 LBS.	RIGHT REAR	744 LBS.
LEFT FRONT	910 LBS.	LEFT REAR	713 LBS.
TOTAL FRONT WEIGHT	1876 LBS.	(56.3% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	1457 LBS.	(43.7% OF TOTAL VEHICLE WEIGHT)	
TOTAL DELIVERED WEIGHT 3333 LBS.			

CALCULATION OF TEST VEHICLE'S TARGET TEST WEIGHT:

RCLW = RATED CARGO AND LUGGAGE WEIGHT*

GVWR = GROSS VEHICLE WEIGHT RATING (5000 LBS)

UDW = UNLOADED DELIVERED WEIGHT (3333 LBS)

VCW = VEHICLE CAPACITY WEIGHT = GVWR - UDW = 5000 - 3333 = 1667 LBS

DSC = DESIGNATED SEATING CAPACITY (3)**

RCLW* = VCW - 150 (DSC) = 5000 - 3333 - 150 (3) = 1217 LBS.

TARGET TEST WEIGHT = UDW + RCLW* + (NO. OF HYBRID II DUMMIES X 164 LBS/DUMMY)

TARGET TEST WEIGHT = 3333 + 300 + 328

TARGET TEST WEIGHT = 3961 LBS

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 282 LBS. OF CARGO WEIGHT:

RIGHT FRONT	913 LBS.	RIGHT REAR	1020 LBS.
LEFT FRONT	992 LBS.	LEFT REAR	1018 LBS.
TOTAL FRONT WEIGHT	1905 LBS.	(48.3% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	2038 LBS.	(51.7% OF TOTAL VEHICLE WEIGHT)	
TOTAL TEST WEIGHT	3943 LBS.	(0.5% UNDER TARGET TEST WEIGHT)	

WEIGHT OF BALLAST SECURED IN VEHICLE CARGO AREA: 183 LBS.

COMPONENTS REMOVED TO MEET TARGET TEST WEIGHT: None

CG = 63.0 INCHES REARWARD OF FRONT WHEEL CENTERLINE

*Cargo weight for multi-purpose passenger vehicles, trucks, and buses is the vehicle's calculated cargo and luggage weight or 300 pounds, whichever is less.

**The designated seating capacity is determined by counting the number of seat belts installed in the vehicle.

TABLE 3 POST-IMPACT DATA

TEST NUMBER: 930224 NHTSA NO.: CP5106
TEST DATE: 02/24/93 TEST TIME: 1519
TEST TYPE: Frontal Barrier Impact IMPACT ANGLE: 0
AMBIENT TEMPERATURE AT IMPACT AREA: 70° F
TEMPERATURE IN OCCUPANT COMPARTMENT: 70° F
IMPACT VELOCITY: PRIMARY = 29.3 MPH SECONDARY = 29.3 MPH
(SPECIFIED RANGE = 28.9 TO 29.9 MPH)
DISTANCE FROM VEHICLE TO BARRIER: ENTERING VELOCITY TRAP = 15.0 IN.
EXITING VELOCITY TRAP = 2.0 IN.

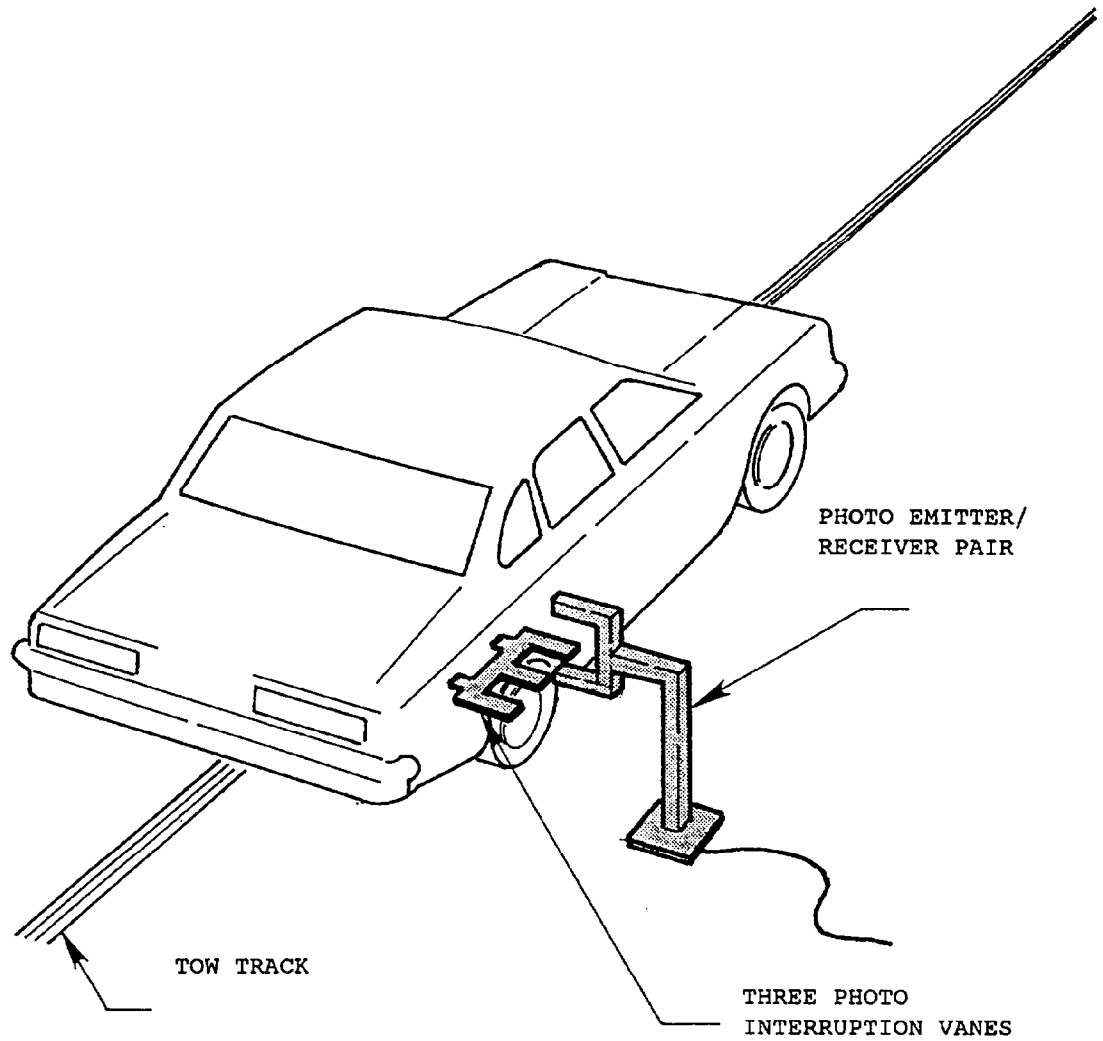
TEST VEHICLE STATIC CRUSH (ALL MEASUREMENTS ARE IN INCHES):

OVERALL LENGTH OF TEST VEHICLE: PRE-TEST: L 203.0; C 209.0; R 203.5
POST-TEST: L 189.8; C 191.5; R 189.8
TOTAL CRUSH: L 13.2; C 17.5; R 13.7
AVERAGE CRUSH: 14.8

TEST VEHICLE REBOUND FROM FLAT BARRIER (ALL MEASUREMENTS ARE IN INCHES):

DISTANCE FROM TEST VEHICLE TO BARRIER: L 10.8; C 9.0; R 10.7; AVG. 10.2

FIGURE 1 IMPACT VELOCITY MEASUREMENT SYSTEM



The final vane clears the final emitter/receiver pair two inches before impact.

The vanes have one foot spacing.

FIGURE 2 ACCIDENT INVESTIGATION DIVISION DATA
FOR 30 MPH FRONTAL BARRIER IMPACT

VEHICLE MAKE/MODEL/BODY STYLE: Toyota/T100/pickup
 VEHICLE NHTSA NO.: CP5106; VIN: JT4VD10A6P0006145
 MODEL YEAR: 1993; BUILD DATE: 11/92; TEST DATE: 02/24/93
 VEHICLE SIZE CATEGORY: Standard pickup; TEST WEIGHT: 3943 LBS.
 VEHICLE WHEELBASE: 121.9 INCHES
 MAXIMUM WIDTH: 75.8 INCHES
 FRONT OVERHANG: 32.0 INCHES

COLLISION DEFORMATION
 CLASSIFICATION (CDC) CODE: 12FDEW2

CRUSH DEPTH
 MEASUREMENTS:

C1 =	<u>13.2</u>	INCHES
C2 =	<u>17.0</u>	INCHES
C3 =	<u>17.6</u>	INCHES
C4 =	<u>18.1</u>	INCHES
C5 =	<u>13.7</u>	INCHES
C6 =	<u>13.7</u>	INCHES

MIDPOINT OF DAMAGE: D = VEHICLE CENTERLINE
(LONGITUDINAL)

LENGTH OF DAMAGED
 REGION: L = 69.5 INCHES

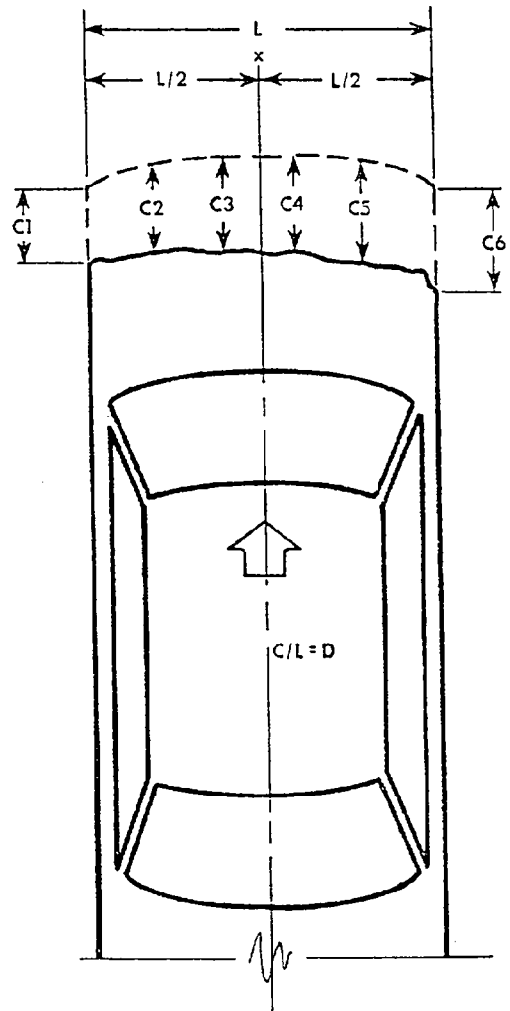
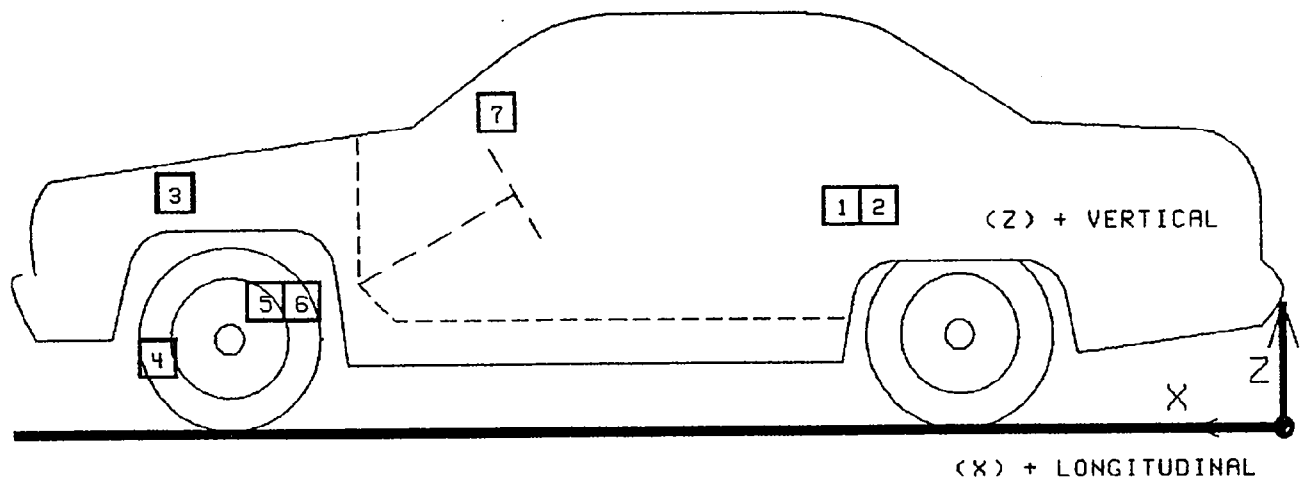
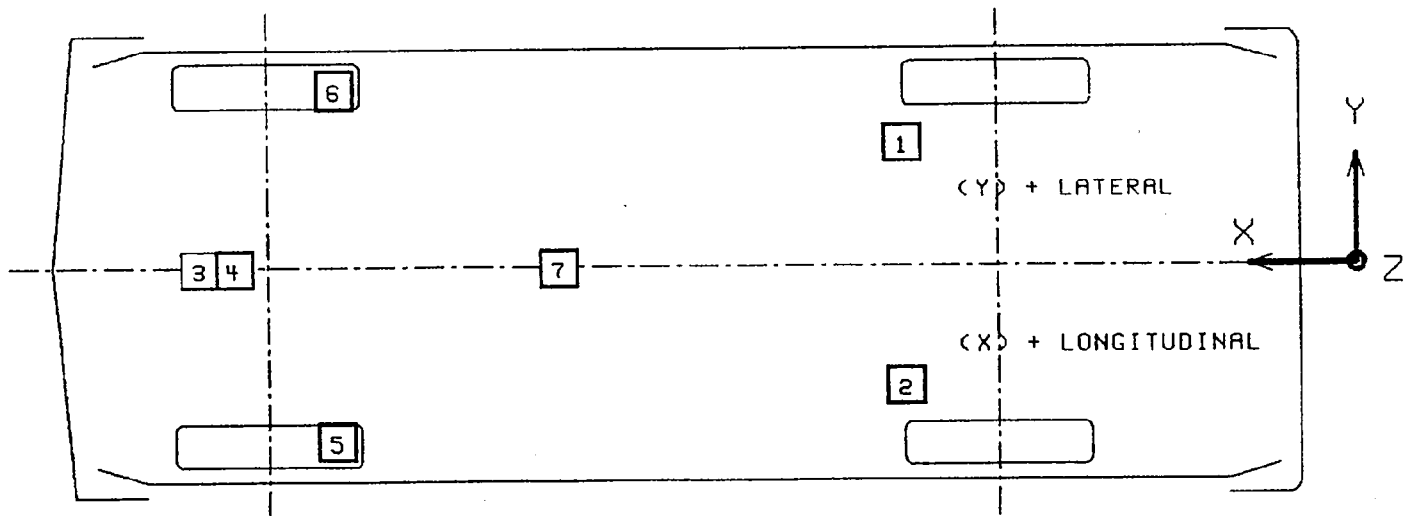


FIGURE 3
VEHICLE ACCELEROMETER PLACEMENT



SIDE VIEW



BOTTOM VIEW

TABLE 4

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 930224

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX G MSEC		MAX G MSEC	
1	LEFT REAR SEAT CROSSMEMBER LONGITUDINAL	PRE 111.0	17.0	21.8				
		POST 110.8	17.0	21.0	3.5	213.4	51.5	24.1
2	RIGHT REAR SEAT CROSSMEMBER LONGITUDINAL	PRE 111.0	-17.0	21.6				
		POST 111.0	-17.0	21.2	2.9	125.4	50.2	23.9
3	ENGINE TOP LONGITUDINAL	PRE 176.0	-0.3	40.5				
		POST 173.8	-2.5	41.5	33.6	50.6	81.3	35.4
4	ENGINE BOTTOM LONGITUDINAL	PRE 176.1	-4.2	16.5				
		POST 173.5	-4.8	15.5	33.4	51.0	72.9	40.8
5	RIGHT BRAKE CALIPER LONGITUDINAL	PRE 173.2	-25.8	14.8				
		POST 171.0	-26.0	15.0	59.5	43.1	133.9	20.5
6	LEFT BRAKE CALIPER LONGITUDINAL	PRE 172.9	25.8	14.5				
		POST 170.8	26.0	15.5	72.3	40.8	145.9	20.5
7	INSTRUMENT PANEL CENTER LONGITUDINAL	PRE 149.1	0.1	47.4				
		POST 155.5	-0.3	47.5	9.1	218.5	47.6	27.1

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

REFERENCE: X: + FORWARD FROM REAR BUMPER
Y: + LEFTWARD FROM VEHICLE CENTERLINE
Z: + UPWARD FROM GROUND LEVEL

REPORT OF VEHICLE CONDITION AT THE COMPLETION OF TESTING

CONTRACT NO.: DTNH22-90-C-21003
FROM: Transportation Research Center Inc.
10820 State Route 347
East Liberty, OH 43319

TO: Mr. Charles Case
COTR
Office of Vehicle Safety Compliance

The following vehicle has been subjected to testing for FMVSS 208. The vehicle was inspected upon arrival at the laboratory for the test and found to contain all of the equipment listed below. All variances have been reported within 2 working days of vehicle arrival, by letter, to the NHTSA Industrial Property Manager/NAD-30, with a carbon copy to the responsible testing office. The vehicle is again inspected, after the above test has been conducted, and all changes are noted below. The final condition of the vehicle is also noted in detail.

NHTSA NO.: CP5106
MAKE/MODEL/BODY STYLE: Toyota/T100/pickup
MODEL YEAR: 1993 BODY COLOR: Red
VIN: JT4VD10A6P0006145
ODOMETER (ARRIVAL): 74 DATE: 01/26/93
ODOMETER (COMPLETION): 76 DATE: 02/24/93
COST: \$13,486.00

☐ AIR CONDITIONER	☐ CONSOLE	BRAKES: ☒ POWER
☒ TINTED GLASS	☐ TACHOMETER	FRONT: Disc
☒ POWER STEERING	☐ SPEED CONTROL	REAR: Drum ABS
☐ POWER WINDOWS	☐ REAR WINDOW DEF.	
☐ POWER DOOR LOCKS	☐ SUN/MOON ROOF	FRONT SEATS: ☐ POWER
☒ RADIO	☐ T-TOP	SEAT TYPE: Bench
☒ CLOCK	☐ TILT STEERING WHEEL	NO. OF SEATS: <u>3</u>
☐ ROOF RACK	☐ OTHER OPTIONS: _____	

ENGINE: 6 CYLINDERS; 3.0 LITERS
TRANSMISSION: 5-speed manual; DRIVE TYPE: Rear wheel drive
TIRE SIZE: P235/75R15
GASOLINE TYPE: Unleaded

EQUIPMENT THAT IS NO LONGER ON THE VEHICLE AS NOTED ABOVE: None

EXPLANATION: NA

VEHICLE CONDITION: Vehicle has been subjected to a 30 mph frontal
barrier crash test.

SECTION 3.0

FMVSS 208, 212, 219 (partial), & 301 DATA

TABLE 5 DUMMY INJURY CRITERIA

MAXIMUM ACCELERATION (G)

	HEAD				CHEST		
	X	Y	Z	R	X	Y	Z
DRIVER	-80.0	19.5	-45.9	92.4	-40.3	-29.9	-16.8
PASSENGER	-26.8	-10.4	-49.8	54.2	-33.5	-7.1	-14.0

MAXIMUM FEMUR COMPRESSIVE FORCE (LBS)

	LEFT FEMUR	RIGHT FEMUR
DRIVER	409	477
PASSENGER	433	402

HEAD INJURY CRITERIA*

	HIC	TIME t_1 (MSEC)	TIME t_2 (MSEC)
DRIVER	484	84.2	93.5
PASSENGER	281	73.6	109.6

CHEST MAXIMUM RESULTANT ACCELERATION**

	ACCEL. (G)	TIME t_1 (MSEC)	TIME t_2 (MSEC)
DRIVER	36.9	51.0	54.1
PASSENGER	33.3	56.9	60.0

*As defined in FMVSS No. 208

**Defined as equal to or exceeding 0.003 sec. duration

Y See DATA ACQUISITION EXPLANATIONS

TABLE 6 POST-IMPACT DUMMY/VEHICLE DATA

VISIBLE DUMMY CONTACT POINTS:

	DRIVER #354	PASSENGER #1173
HEAD	<u>Chest and steering wheel hub</u>	<u>Chest</u>
	Lower	
CHEST	<u>steering wheel rim</u>	<u>None</u>
	Lower	
ABDOMEN	<u>steering wheel rim</u>	<u>None</u>
LEFT KNEE	<u>Instrument panel</u>	<u>Instrument panel</u>
RIGHT KNEE	<u>Instrument panel</u>	<u>Instrument panel</u>

DOOR OPENING:

	LEFT	RIGHT
FRONT	<u>Easy</u>	<u>Easy</u>
REAR	<u>NA</u>	<u>NA</u>

SEAT MOVEMENT:

	SEAT BACK FAILURE	SEAT SHIFT
FRONT	<u>None</u>	<u>None</u>
REAR	<u>NA</u>	<u>NA</u>

GLAZING DAMAGE:

None

OTHER NOTABLE IMPACT EFFECTS:

None

DUMMY KINEMATIC SUMMARY

Driver Dummy

Upon impact, the driver dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's abdomen and then chest impacted the lower steering wheel rim. The dummy's head rotated downward impacting the dummy's chest and the steering wheel hub. The driver dummy was restrained by the three-point unbelt. The dummy rebounded rearward into the seat back as the dummy's head rotated rearward into the head restraint. The driver dummy came to rest in the driver's seat restrained by the three-point unbelt.

Right Front Passenger Dummy

Upon impact, the right front passenger dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head rotated downward impacting the dummy's chest. The right front passenger dummy was restrained by the three-point unbelt. The dummy rebounded rearward, and slightly to the right, into the seat back as the dummy's head rotated rearward into the head restraint. The right front passenger dummy came to rest in the right front passenger's seat restrained by the three-point unbelt.

TABLE 7 FMVSS 208 COMFORT AND CONVENIENCE DATA FOR MANUAL SEAT BELTS

MAKE/MODEL: Toyota/T100

VIN: JT4VD10A6P0006145

BODY STYLE: pickup

NHTSA NO.: CP5106

DATE OF MANUFACTURE: 11/92

WEBBING TENSION - RELIEVING DEVICE:

DO OUTBOARD SEATING POSITION SEAT BELTS HAVE WEBBING TENSION - RELIEVING DEVICES?(check one): NO

IF YES:

MAXIMUM SLACK RECOMMENDED IN OWNER'S MANUAL: _____ INCHES

DOES OWNER'S MANUAL WARN THAT INTRODUCING SLACK BEYOND THE AMOUNT SPECIFIED CAN SIGNIFICANTLY REDUCE THE EFFECTIVENESS OF THE SHOULDER BELT? _____ YES _____ NO

IF NO, EXPLAIN:

THE WEBBING TENSION - RELIEVING DEVICE IS CANCELLED WHEN

(check one): _____ The adjacent door is opened.
_____ The latch plate is released from the buckle.
_____ A manual means is activated on a open-body vehicle without doors.

OPEN-BODY VEHICLE (without doors): DOES THE MANUAL MEANS TO CANCEL THE WEBBING TENSION - RELIEVING DEVICE OPERATE PROPERLY? _____ YES
_____ NO

IF NO, EXPLAIN:

BELT CONTACT FORCE:

BELT CONTACT FORCE ON CHEST OF TEST DUMMY: 0.2 POUNDS

_____ NOT APPLICABLE, THE VEHICLE'S SEAT BELT SYSTEM INCLUDED A WEBBING TENSION - RELIEVING DEVICE.

TABLE 7 FMVSS 208 COMFORT & CONVENIENCE DATA FOR MANUAL SEAT BELTS, CONTD.

MAKE/MODEL: Toyota/T100

VIN: JT4VD10A6P0006145

BODY STYLE: pickup

NHTSA NO.: CP5106

DATE OF MANUFACTURE: 11/92

LATCHPLATE ACCESS:

ARE THE SEAT BELT LATCHPLATES, IN THEIR NORMAL STOWED POSITION, WITHIN
THE REACH ENVELOPE? YES

DOES THE CLEARANCE TEST BLOCK MOVE UNHINDERED TO THE LATCHPLATE OR
BUCKLE? YES

RETRACTION:

SEAT BELT AUTOMATICALLY RETRACTS WHEN

(check one): The adjacent vehicle door is open and the seat belt
latchplate is released.

 X The seat belt latchplate is released.

ARE THE STOWED SEAT BELT WEBBING AND HARDWARE PINCHED WHEN THE DOOR IS
CLOSED? NO

OPEN-BODY VEHICLE (without doors): DOES THE SEAT BELT SYSTEM FULLY
RETRACT WHEN THE WEBBING TENSION-RELIEVING DEVICE IS MANUALLY
DEACTIVATED? YES NO

ACCESSIBILITY:

IS THE SEAT CUSHION REMOVABLE SO THE SEAT BACK SERVES A FUNCTION OTHER
THAN SEATING? NO

IS THE SEAT REMOVABLE? NO

IS THE SEAT MOVABLE SO THE SPACE FORMERLY OCCUPIED BY THE SEAT CAN BE
USED FOR A SECONDARY FUNCTION? NO

NOTE: IF ANY OF THE ABOVE ANSWERS ARE "YES", THE ACCESSIBILITY
REQUIREMENTS DO NOT APPLY.

TABLE 7 FMVSS 208 COMFORT & CONVENIENCE DATA FOR MANUAL SEAT BELTS, CONT'D

MAKE/MODEL: Toyota/T100

VIN: JT4VD10A6P0006145

BODY STYLE: pickup

NHTSA NO.: CP5106

DATE OF MANUFACTURE: 11/92

ACCESSIBILITY, CONT'D:

IF WEBBING IS DESIGNED TO PASS THROUGH THE SEAT CUSHION OR BETWEEN THE CUSHION AND SEAT BACK ARE ONE OF THE FOLLOWING PARTS NORMALLY ON TOP OF OR ABOVE THE SEAT CUSHION: LATCHPLATE, BUCKLE, WEBBING? YES

ARE THE REMAINING TWO PARTS ACCESSIBLE UNDER NORMAL CONDITIONS?

Not Applicable, the webbing is not designed to pass through the seat
YES

DO THE LATCHPLATE AND BUCKLE PASS THROUGH THE GUIDES PROVIDED AND FALL BEHIND THE SEAT WHEN THE BELT IS COMPLETELY RETRACTED (OR DETACHED IF NOT RETRACTABLE); THE SEAT IS MOVED TO ANY POSITION; AND THE SEAT BACK, IF FOLDABLE, IS FOLDED FORWARD AS FAR AS POSSIBLE AND THEN MOVED BACKWARD INTO POSITION? NO

IS THE INBOARD RECEPTACLE END OF THE OUTBOARD SEATING POSITION'S SEAT BELT ACCESSIBLE WITH THE CENTER ARM REST IN ANY POSITION TO WHICH IT CAN BE ADJUSTED WITHOUT MOVING THE ARM REST FOR ACCESS? YES

TABLE 8 FMVSS 208 SEAT BELT WARNING SYSTEM DATA

WITH OCCUPANT IN DRIVER'S POSITION AND UNIBELT IN STOWED POSITION AND
IGNITION SWITCH PLACED IN "START/ON" POSITION:

Duration of audible warning signal = 7 sec.

Duration of reminder light operation = continuous sec.

WITH OCCUPANT IN DRIVER'S POSITION AND UNIBELT IN USE AND THE IGNITION
SWITCH PLACED IN "START/ON" POSITION:

Duration of audible warning signal = 0 sec.

(NOTE: audible warning should not operate)

Duration of reminder light operation = 0 sec.

WORDING OF VISUAL WARNING:

 Fasten Seat Belt

 Fasten Belt

 X Symbol 101-80

 Other: _____

TABLE 9 FMVSS 208 LABELING AND DRIVER'S MANUAL DATA

DESCRIBE LOCATION OF LABEL WHICH DESCRIBES MANUFACTURER'S MAINTENANCE OR
REPLACEMENT SCHEDULE FOR CRASH-DEPLOYED OCCUPANT PROTECTON SYSTEM:

Not applicable, vehicle did not contain a crash-deployed occupant protection
system.

TABLE 10 FMVSS 208 READINESS INDICATOR DATA

AN OCCUPANT RESTRAINT SYSTEM THAT DEPLOYS IN THE EVENT OF A CRASH SHALL HAVE A MONITORING SYSTEM WITH A READINESS INDICATOR. A TOTALLY MECHANICAL SYSTEM IS EXEMPT FROM THIS REQUIREMENT.

Not applicable, vehicle did not contain a crash-deployed occupant protection system.

FIGURE 4 FMVSS 212 TEST DATA

DETAILS OF WINDSHIELD MOUNTING SUCH AS RETENTION METHOD, TRIM TYPE, ETC.:

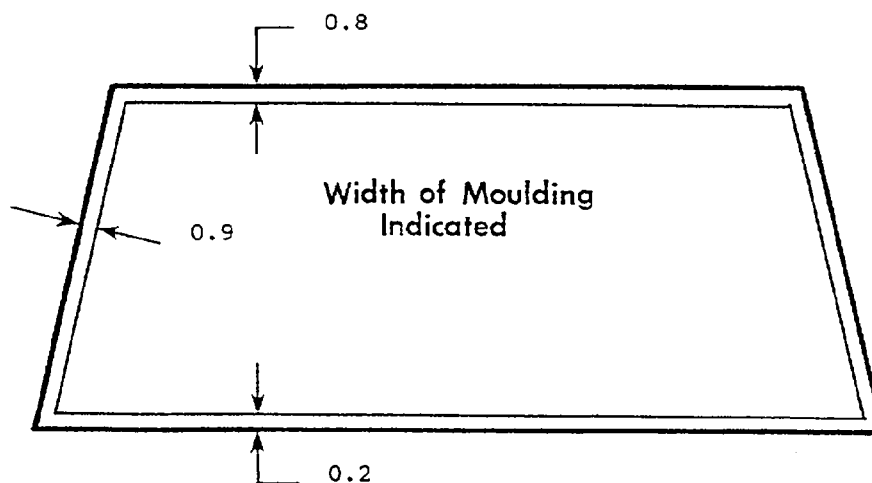
Plastic trim around outer perimeter, adhesive around inner perimeter.

FMVSS 212 REQUIREMENTS: The post-test periphery retention amount must be at least 75% of the pre-test periphery measurement for vehicles NOT equipped with automatic restraints, and 50% for each side of windshield for vehicles equipped with automatic restraint systems for front occupants.

WINDSHIELD PERIPHERY MEASUREMENTS:

	PRE-TEST	POST-TEST	PERCENT RETENTION
RIGHT SIDE	81.5	81.5	100
LEFT SIDE	81.5	81.5	100
TOTAL	163.0	163.0	100

PRE-TEST WINDSHIELD MOUNTING MATERIAL TEMPERATURE: 70° F



FRONT VIEW OF WINDSHIELD*

LOSS OF WINDSHIELD RETENTION LENGTHS: None

ALL DISTANCE MEASUREMENTS ARE IN INCHES.

*INDICATE AREAS OF LOSS OF RETENTION, IF ANY, ON WINDSHIELD DIAGRAM.

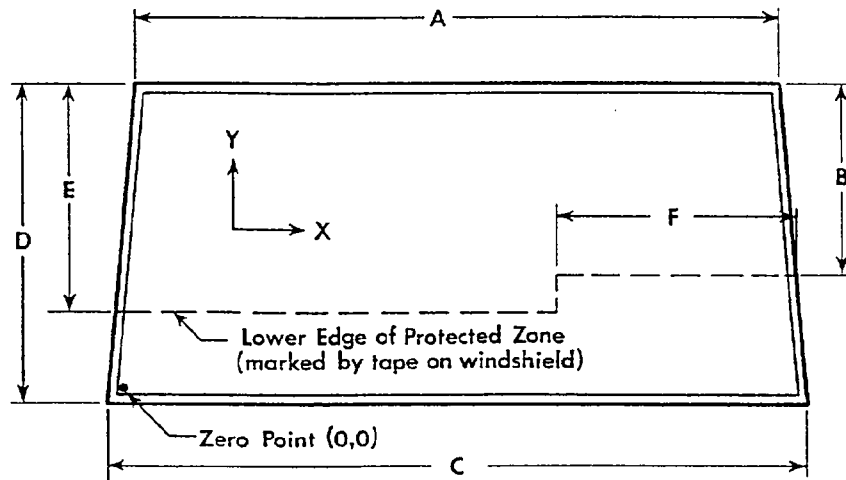
FIGURE 5 FMVSS 219 TEST DATA

PROTECTED ZONE LOWER EDGE REQUIREMENT:

The lower edge of the protected zone is determined by placing a 6.5-inch diameter rigid sphere weighing 15 pounds in a position such that it simultaneously contacts the inner surface of the windshield and the top surface of the instrument panel including padding. Draw the locus of points on the inner surface of the windshield contactable by the sphere across the width of the instrument panel. From the outermost contactable points, extend the locus line horizontally to the edges of the windshield, and then draw a line on the inner surface of the windshield below and 0.5 inch from the locus line. The LOWER EDGE OF THE PROTECTED ZONE is the longitudinal projection onto the outer surface of the windshield of this line.

WINDSHIELD MEASUREMENTS:

A = 51.8
 B = 15.4
 C = 18.8
 D = 25.9
 E = 53.0
 F = 40.8



FRONT VIEW

METHOD OF ADHERING PROTECTED ZONE TEMPLATE TO WINDSHIELD: NA

AREAS OF WINDSHIELD TEMPLATE PENETRATION
GREATER THAN 0.25 IN.: NA

COORDINATES
 X Y
 1.
 2.
 3.

AREAS OF WINDSHIELD PENETRATION, BELOW THE PROTECTED ZONE,
THROUGH THE INNER SURFACE OF THE WINDSHIELD: None

1.
 2.
 3.

ALL MEASUREMENTS ARE IN INCHES.

TABLE 11 FUEL SYSTEM DATA

MAKE/MODEL: Toyota/T100

NHTSA NO.: CP5106

FUEL SYSTEM CAPACITY: 24.0 GALLONS (FROM OWNER'S MANUAL)

USABLE CAPACITY: 23.8 GALLONS (FURNISHED BY COTR)

TEST VOLUME RANGE: 21.9 GALLONS TO 22.4 GALLONS (92-94% OF USABLE)

ACTUAL TEST VOLUME: 22.3 GALLONS (WITH ENTIRE FUEL SYSTEM FILLED)

TEST FLUID TYPE: STODDARD SOLVENT

SPECIFIC GRAVITY: 0.764

KINEMATIC VISCOSITY: 0.99 CENTISTOKES

TEST FLUID COLOR: PURPLE

DETAILS OF FUEL SYSTEM: The fuel filler is on the right. The fuel tank
is in front of the rear axle. The fuel lines run along the right frame
rail to the front.

ELECTRIC FUEL PUMP: Yes FUEL INJECTION: Yes

DOES ELECTRIC FUEL PUMP OPERATE WITH IGNITION SWITCH "ON" AND THE ENGINE NOT
OPERATING? No

TABLE 12 FMVSS 301 POST-IMPACT TEST DATA

TEST VEHICLE NHTSA NO.: CP5106 ; TEST DATE: 02/24/93

VEHICLE MAKE/MODEL/BODY STYLE: Toyota/T100/pickup

TEST REQUIREMENTS:

Test vehicle fuel tank filled to 92 to 94% of manufacturer's usable capacity and with electric fuel pump operating (if it will operate without engine operation). Part 572 test dummies located at each front designated seating position.

TEST VEHICLE IMPACT TYPE:

X FRONTAL (30 MPH)
 OBLIQUE (30 MPH) WITH ° BARRIER FACE
 FIRST CONTACTING (DRIVER/PASS.) SIDE.
 REAR MOVING BARRIER (30 MPH)
 LATERAL MOVING BARRIER (20 MPH)

FUEL SYSTEM FLUID SPILLAGE MEASUREMENTS:

	<u>TEST</u> <u>RESULTS</u>	<u>MAXIMUM</u> <u>ALLOWABLE</u>
1. FROM IMPACT UNTIL VEHICLE MOTION CEASES - - -	0 OZ.	1 OZ.
2. 5 MINUTE PERIOD AFTER VEHICLE MOTION CEASES -	0 OZ.	5 OZ.
3. NEXT 25 MINUTES AFTER 5 MINUTE PERIOD - - - -	0 OZ.	1 OZ./1 MIN.

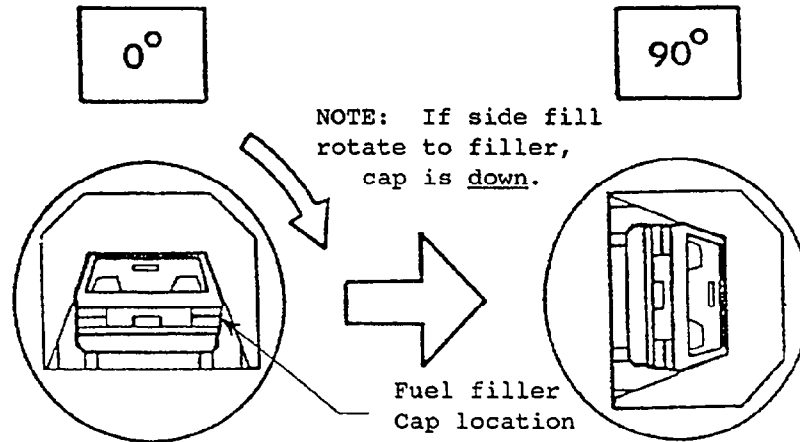
FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

FIGURE 6 FMVSS 301 STATIC ROLLOVER TEST DATA

NHTSA NO.: CP5106

TEST PHASE



STATIC ROLLOVER MACHINE ROTATION TIME INFORMATION: (Spec. Range = 1-3 min.)

TIME REQ. FOR MACHINE TO ROTATE 90° = 2 minutes, 00 seconds

FMVSS 301 POSITION HOLD TIME = 5 minutes, 00 seconds

TOTAL - - - - - = 7 minutes, 00 seconds

NEXT WHOLE MINUTE INTERVAL - - - - - = 7 minutes

FUEL SYSTEM FLUID SPILLAGE MEASUREMENTS:

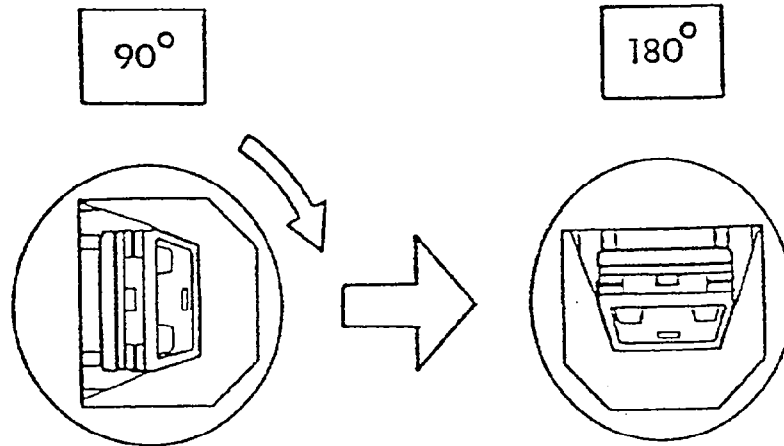
<u>0° TO 90° ROTATION (FUEL FILLER CAP DOWN)</u>	<u>TEST RESULTS</u>	<u>MAXIMUM ALLOWABLE</u>
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - -	0 oz.	5 oz.
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - -	0 oz.	1 oz.
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - -	0 oz.	1 oz.

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

FIGURE 6 FMVSS 301 STATIC ROLLOVER TEST DATA, CONT'D.

NHTSA NO.: CP5106
TEST PHASE



STATIC ROLLOVER MACHINE ROTATION TIME INFORMATION: (Spec. Range = 1-3 min.)

TIME REQ. FOR MACHINE TO ROTATE 90° = 2 minutes, 00 seconds

FMVSS 301 POSITION HOLD TIME = 5 minutes, 00 seconds

TOTAL - - - - - = 7 minutes, 00 seconds

NEXT WHOLE MINUTE INTERVAL - - - - = 14 minutes

FUEL SYSTEM FLUID SPILLAGE MEASUREMENTS:

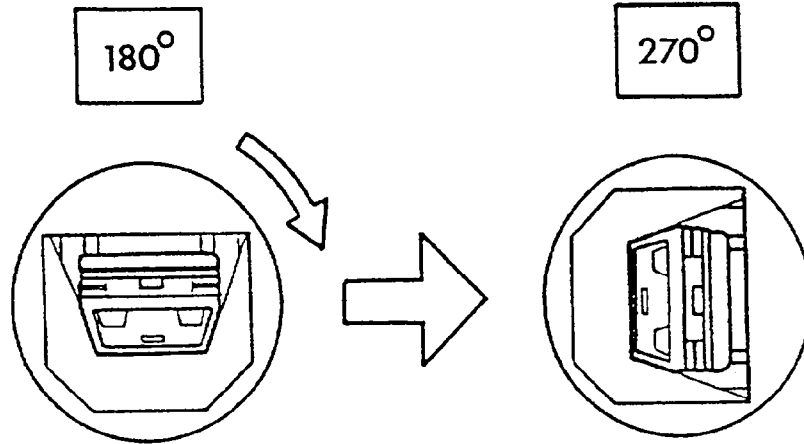
<u>90° TO 180° ROTATION</u>	<u>TEST RESULTS</u>	<u>MAXIMUM ALLOWABLE</u>
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - -	0 oz.	5 oz.
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - -	0 oz.	1 oz.
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - -	0 oz.	1 oz.

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

FIGURE 6 FMVSS 301 STATIC ROLLOVER TEST DATA, CONT'D.

NHTSA NO.: CP5106
TEST PHASE



STATIC ROLLOVER MACHINE ROTATION TIME INFORMATION: (Spec. Range = 1-3 min.)

TIME REQ. FOR MACHINE TO ROTATE 90° = 2 minutes, 00 seconds
FMVSS 301 POSITION HOLD TIME = 5 minutes, 00 seconds
TOTAL - - - - - = 7 minutes, 00 seconds
NEXT WHOLE MINUTE INTERVAL - - - - - = 21 minutes

FUEL SYSTEM FLUID SPILLAGE MEASUREMENTS:

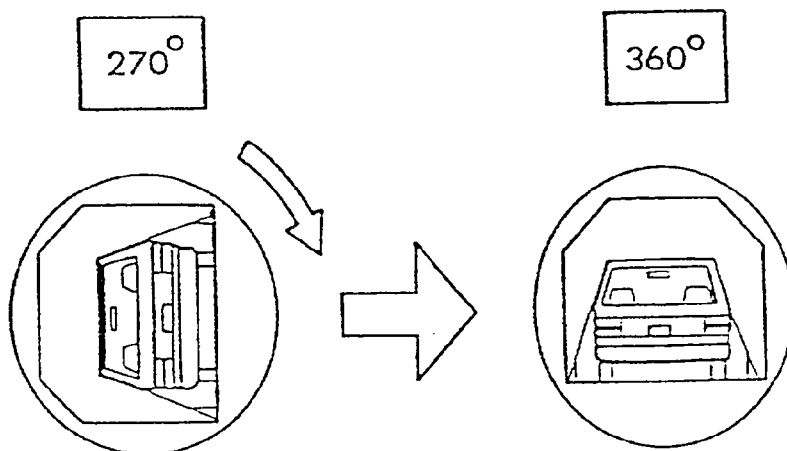
<u>180° TO 270° ROTATION</u>	<u>TEST RESULTS</u>	<u>MAXIMUM ALLOWABLE</u>
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - -	0 oz.	5 oz.
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - -	0 oz.	1 oz.
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - -	0 oz.	1 oz.

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

FIGURE 6 FMVSS 301 STATIC ROLLOVER TEST DATA, CONT'D.

NHTSA NO.: CP5106
TEST PHASE



STATIC ROLLOVER MACHINE ROTATION TIME INFORMATION: (Spec. Range = 1-3 min.)

TIME REQ. FOR MACHINE TO ROTATE 90° = 2 minutes, 00 seconds

FMVSS 301 POSITION HOLD TIME = 5 minutes, 00 seconds

TOTAL - - - - - = 7 minutes, 00 seconds

NEXT WHOLE MINUTE INTERVAL - - - - - = 28 minutes

FUEL SYSTEM FLUID SPILLAGE MEASUREMENTS:

<u>270° TO 360° ROTATION</u>	<u>TEST RESULTS</u>	<u>MAXIMUM ALLOWABLE</u>
1. FIRST 5 MINUTES FROM ONSET OF ROTATION - - - - -	0 oz.	5 oz.
2. 6TH MINUTE FROM ONSET OF ROTATION - - - - -	0 oz.	1 oz.
3. 7TH MINUTE FROM ONSET OF ROTATION - - - - -	0 oz.	1 oz.

FUEL SYSTEM FLUID SPILLAGE LOCATION(S):

None

SECTION 4.0

VEHICLE, OCCUPANT, AND CAMERA MEASUREMENTS

FIGURE 7

PRE-TEST AND POST-TEST MEASUREMENT POINTS

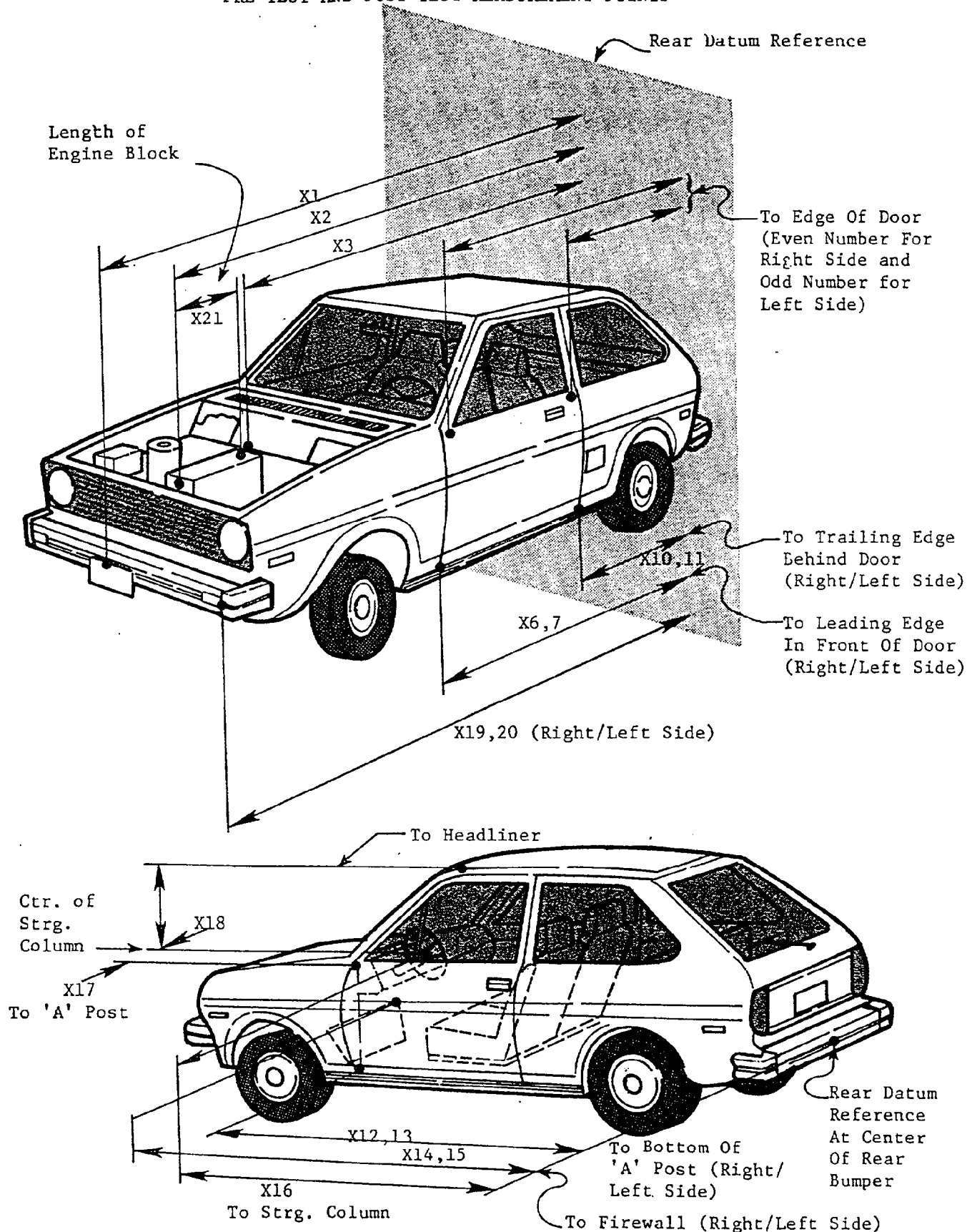
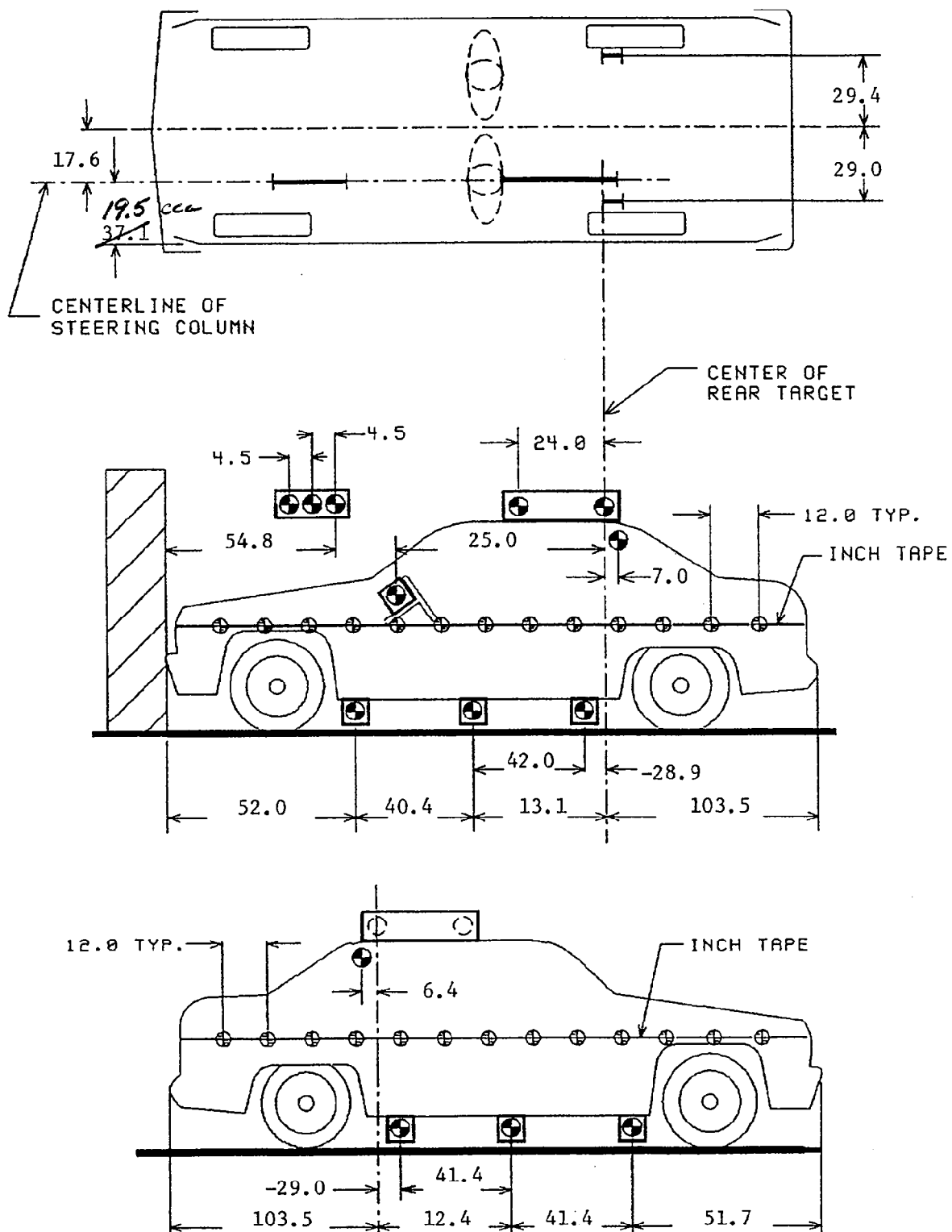


TABLE 13 IMPACTED VEHICLE MEASUREMENTS

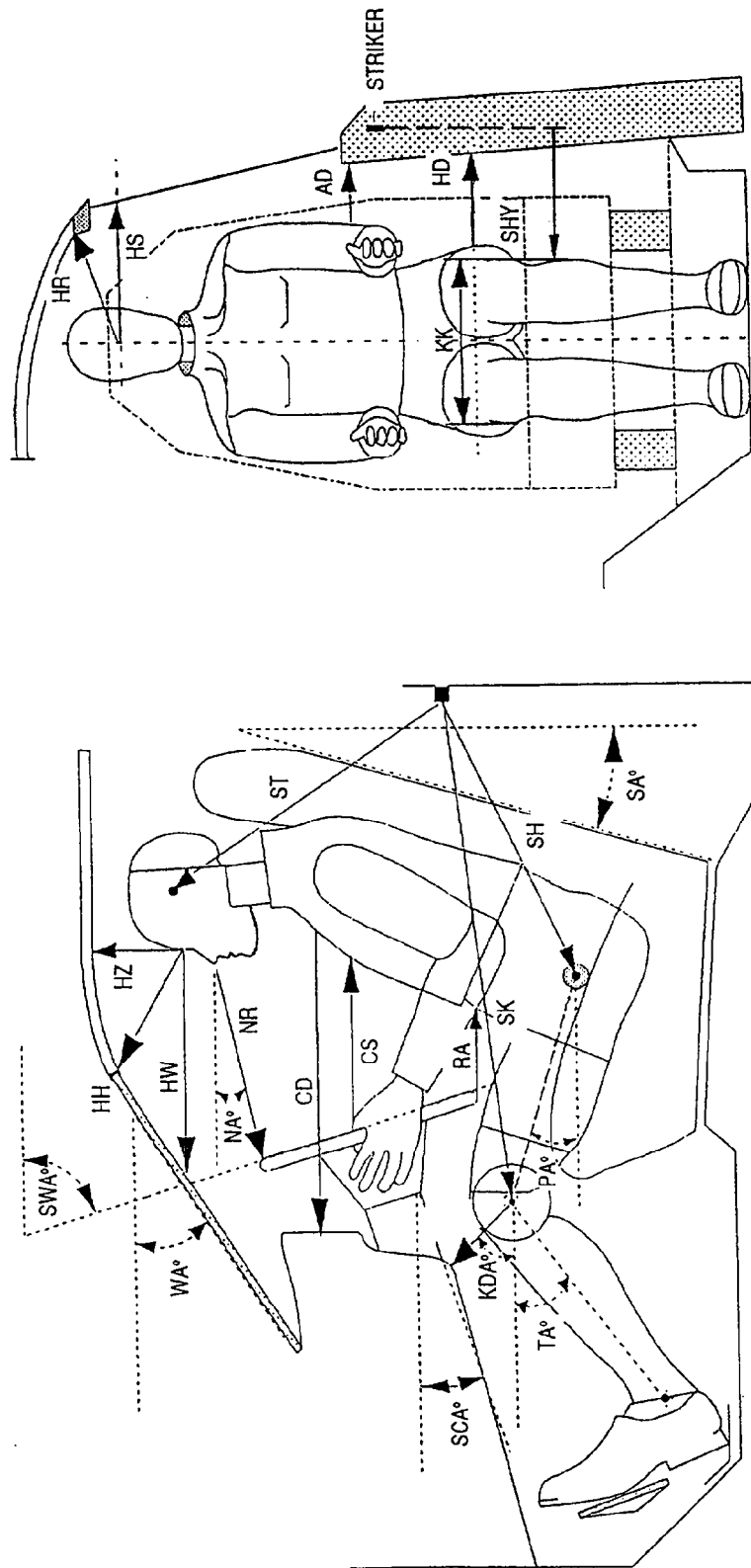
VEHICLE MAKE/MODEL: Toyota/T100		TEST NUMBER: 930224		ALL MEASUREMENTS ARE IN INCHES		
NO.	TYPE OF MEASUREMENT	PRE-TEST	POST-TEST	DIFF.		
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	209.0	191.5	17.5		
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	187.0	185.0	2.0		
X3	REAR SURFACE OF VEHICLE TO FIREWALL	166.0	166.8	-0.8		
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	156.0	156.1	-0.1		
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	155.8	156.0	-0.2		
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	155.0	154.9	0.1		
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	155.8	155.2	0.6		
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	110.0	110.5	-0.5		
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	110.0	110.4	-0.4		
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	110.0	110.3	-0.3		
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	110.0	110.4	-0.4		
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	153.2	154.8	-1.6		
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	153.5	154.8	-1.3		
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	166.0	166.7	-0.7		
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	166.6	167.2	-0.6		
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	135.6	138.9	-3.3		
X17	CENTER OF STEERING COLUMN TO "A" POST	9.5	10.5	-1.0		
X18	CENTER OF STEERING COLUMN TO HEADLINER	16.6	17.4	-0.8		
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	203.5	189.8	13.7		
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	203.0	189.8	13.2		
X21	LENGTH OF ENGINE BLOCK	19.0	19.0	0.0		

FIGURE 8
VEHICLE TARGET LOCATIONS

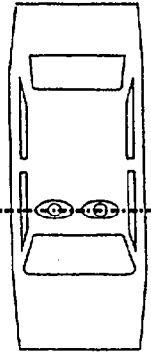


ALL DISTANCE MEASUREMENTS ARE IN INCHES.

FIGURE 9
DUMMY MEASUREMENT LOCATIONS FOR FRONT SEAT OCCUPANTS



VERTICAL TRANSVERSE PLANE



VERTICAL LONGITUDINAL PLANE

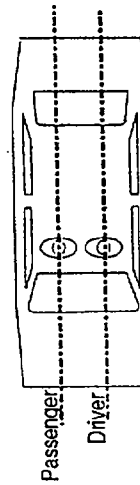


TABLE 14 DUMMY MEASUREMENT DATA FOR FRONT SEAT OCCUPANTS

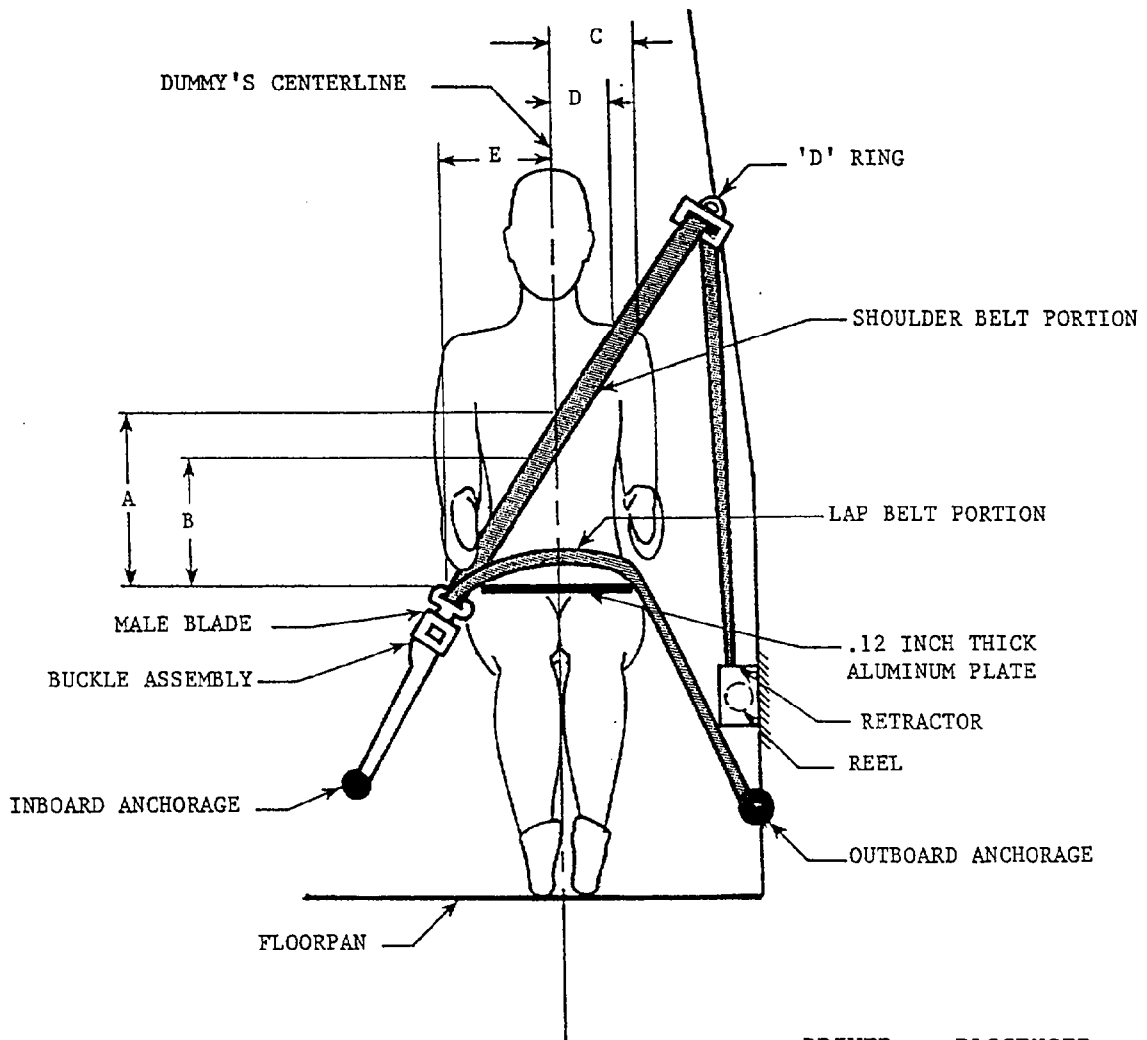
DESIGNATION	TYPE OF MEASUREMENT	DRIVER (SERIAL #354)	PASSENGER (SERIAL #1173)
WA°	WINDSHIELD ANGLE	39°	NA
SWA°	STEERING WHEEL ANGLE	66°	NA
SCA°	STEERING COLUMN ANGLE	26°	NA
SA°	SEAT BACK ANGLE	15°	15°
HZ	HEAD TO ROOF	7.2	7.0
HH	HEAD TO HEADER	14.8	16.2
HW	HEAD TO WINDSHIELD	20.2	20.8
HR	HEAD TO SIDE HEADER	8.5	8.1
NR	NOSE TO RIM	16.8	NA
NA	NOSE TO RIM ANGLE	20°	NA
CD	CHEST TO DASH	22.1	25.2
CS	STEERING WHEEL TO CHEST	14.1	NA
RA	RIM TO ABDOMEN	8.1	NA
KDL	LEFT KNEE TO DASH	9.0	9.1
KDR	RIGHT KNEE TO DASH	9.4	8.5
KDA	OUTBOARD KNEE TO DASH ANGLE	33°	29°
PA°	PELVIC ANGLE	13°	14°
TA°	TIBIAL ANGLE	34°	36°
KK	KNEE TO KNEE	14.5	12.0
ST*	STRIKER TO HEAD	22.7	21.9
	STRIKER TO HEAD ANGLE	-69°	-72°
SK*	STRIKER TO KNEE	27.5	29.1
	STRIKER TO KNEE ANGLE	2°	0°
SH*	STRIKER TO H-POINT	13.1	15.1
	STRIKER TO H-POINT ANGLE	19°	17°
SHY	STRIKER TO H-POINT (Y DIR.)	8.7	8.1
HS	HEAD TO SIDE WINDOW	11.7	11.6
HD	H-POINT TO DOOR	6.9	5.8
AD	ARM TO DOOR	4.4	4.3

THE SEAT BACK ANGLE (SA°) IS MEASURED RELATIVE TO VERTICAL, ALL OTHER ANGLES ARE MEASURED RELATIVE TO HORIZONTAL.

*A negative angle indicates the measurement point was located above the striker.

ALL DISTANCE MEASUREMENTS ARE IN INCHES.

FIGURE 10 SEAT BELT POSITIONING DATA



	DRIVER DUMMY	PASSENGER DUMMY
A - TOP SURFACE OF ALUM. PLATE TO BELT UPPER EDGE	13.5	15.5
B - TOP SURFACE OF ALUM. PLATE TO BELT LOWER EDGE	10.0	12.0
C - DUMMY CENTERLINE TO OUTER EDGE OF BELT AT CHEST FLESH TOP	5.0	5.0
D - DUMMY CENTERLINE TO INNER EDGE OF BELT AT CHEST FLESH TOP	2.5	2.5
E - DUMMY CENTERLINE TO INTERSECTION OF UPPER TORSO BELT AND LAP BELT	7.2	8.8
ALL DISTANCE MEASUREMENTS ARE IN INCHES.		

FIGURE 11. CAMERA POSITIONS

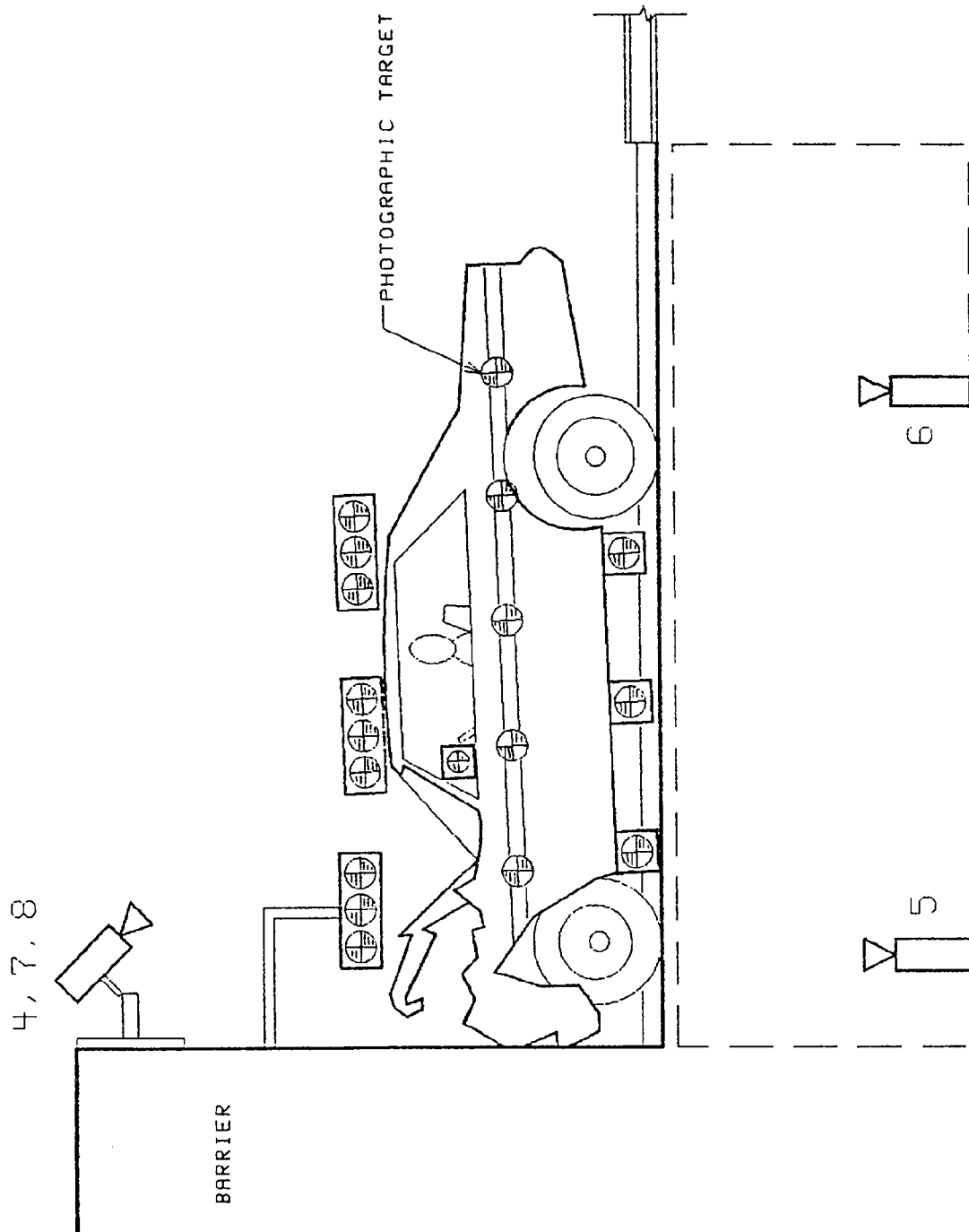


FIGURE 11 CAMERA POSITIONS, CONT'D.

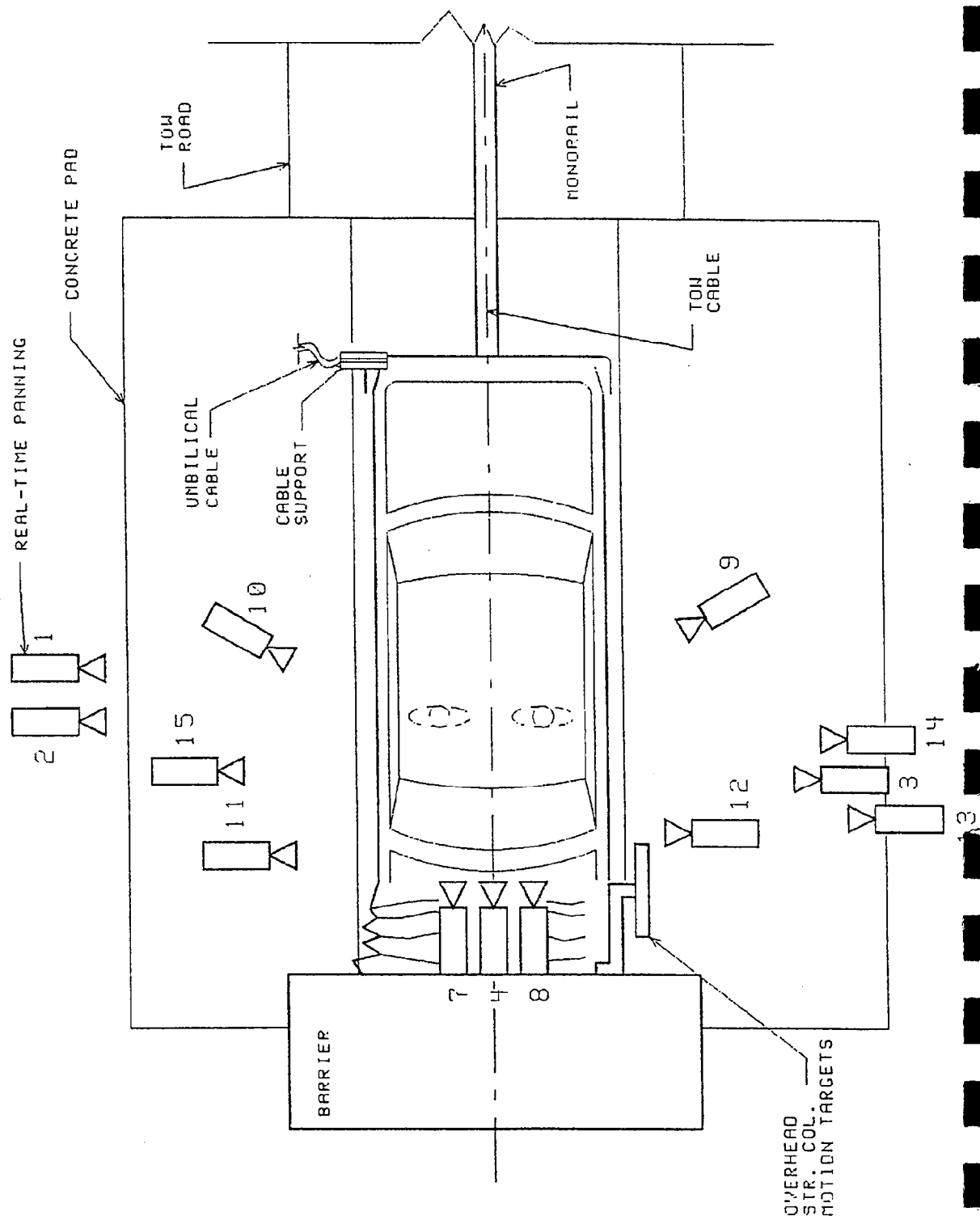


TABLE 15 MOTION PICTURE CAMERA LOCATIONS

TEST NO.: 930224		VEHICLE: Toyota T100 pickup				FILM PLANE			FILM
CAMERA NO.	VIEW	CAMERA POSITIONS (IN)*			ANGLE** (DEG)	TO HEAD TARGET (IN)	LENS (MM)	SPEED (FPS)	
		X	Y	Z					
1	Real-time panning	-142.0	-504.0	61.0	NA	NA	16	24	
2	Right overall	-81.3	-266.4	37.1	-2	NA	13	498	
3	Left vehicle crush	-41.5	295.0	44.0	-4	221.0	25	1022	
4	Windshield front view	-6.0	0.0	84.0	-40	NA	13	495	
5	Pit-left subframe sidemember	-8.0	29.0	-16.0	90	NA	13	1000	
6	Pit-right subframe sidemember	-7.0	30.0	-12.0	90	NA	13	998	
7	Passenger front view	-4.5	-13.8	93.0	-50	NA	17	505	
8	Driver front view	-6.8	14.5	93.0	-50	NA	17	500	
9	Driver kinematics	-157.3	116.0	87.0	-27	93.0	25	498	
10	Passenger kinematics	-152.1	-116.0	87.0	-26	96.0	25	508	
11	Right windshield intrusion	-38.1	-306.1	44.0	0	NA	50	498	
12	Left windshield intrusion	-53.0	309.4	42.3	0	NA	50	505	
13	Steering column motion	-108.0	285.0	103.0	-14	NA	25	510	
14	Steering column motion	-108.0	285.0	75.1	-9	NA	25	502	
15	Passenger kinematics	-38.8	-293.0	45.3	-4	230.0	25	1000	
16	Real-time documentation	NA	NA	NA	NA	NA	12-120	24	

* +X = Film plane forward of barrier face

+Y = Film plane to left of monorail centerline

+Z = Film plane above ground level

** +Angle = Film plane angled upward from horizontal plane

APPENDIX A

PHOTOGRAPHS



Figure A-1. PRE-TEST FRONT VIEW

A-2

930224

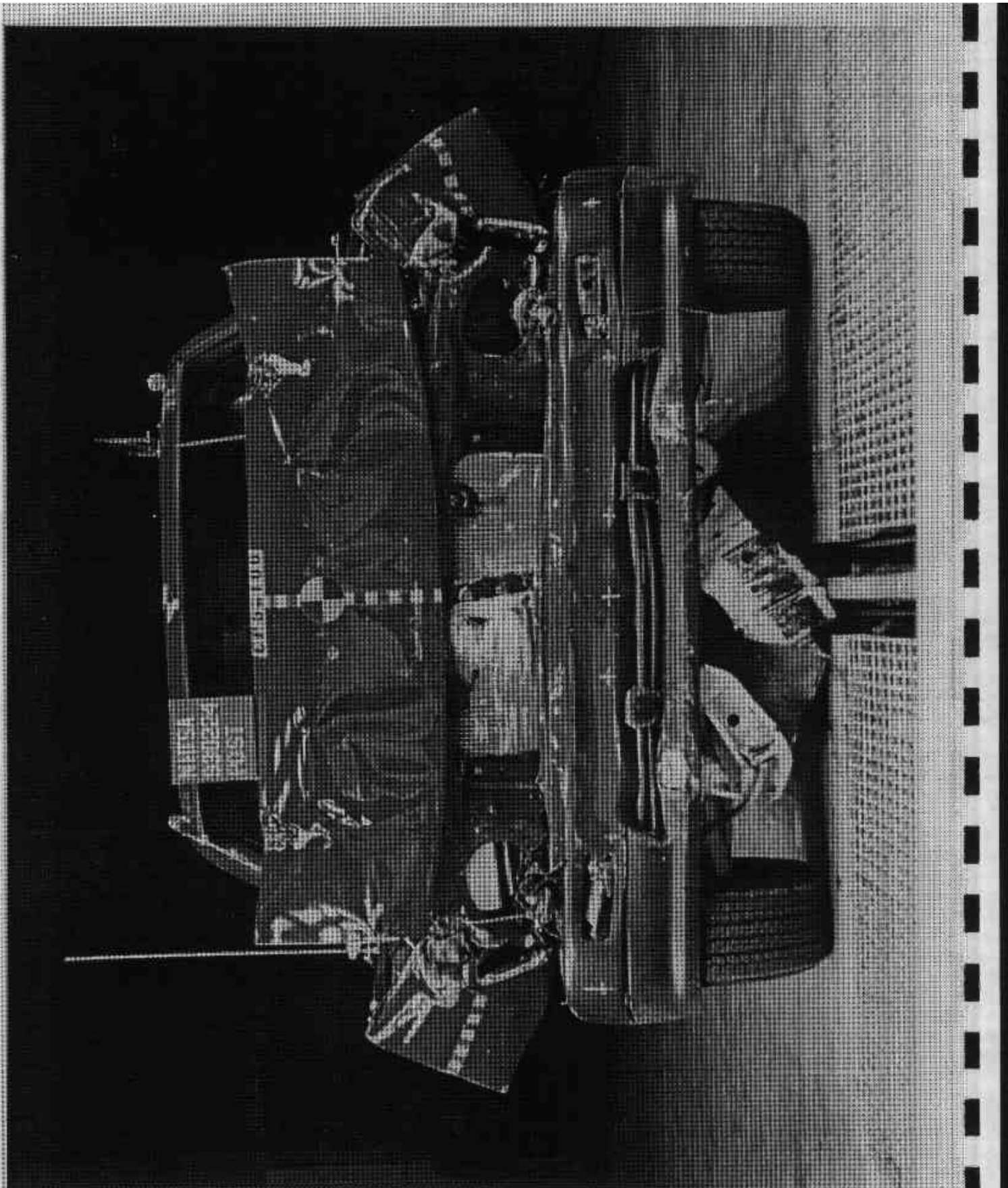


Figure A-2. POST-TEST FRONT VIEW
A-3

930224

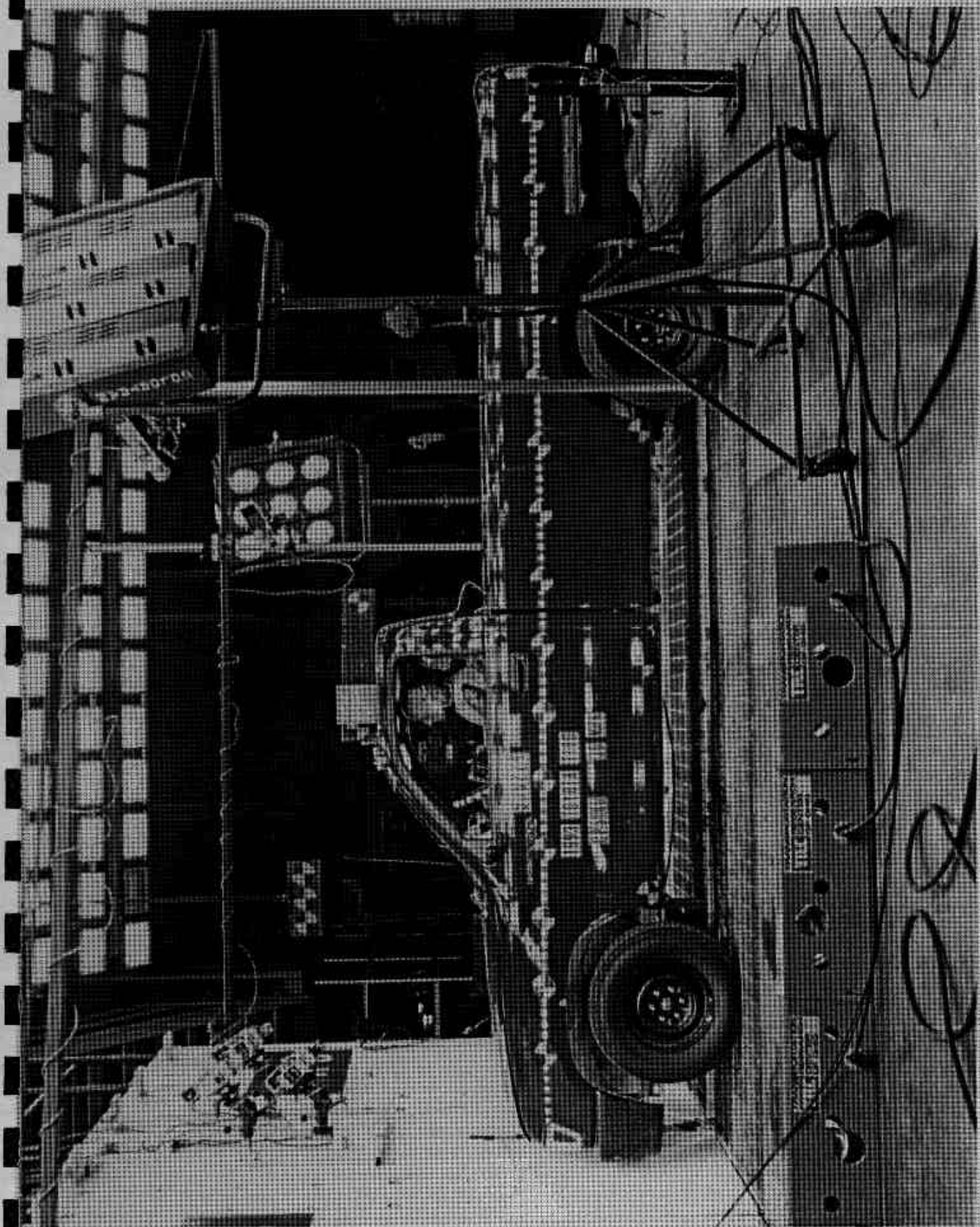


Figure A-3. PRE-TEST LEFT SIDE VIEW

A4

930224

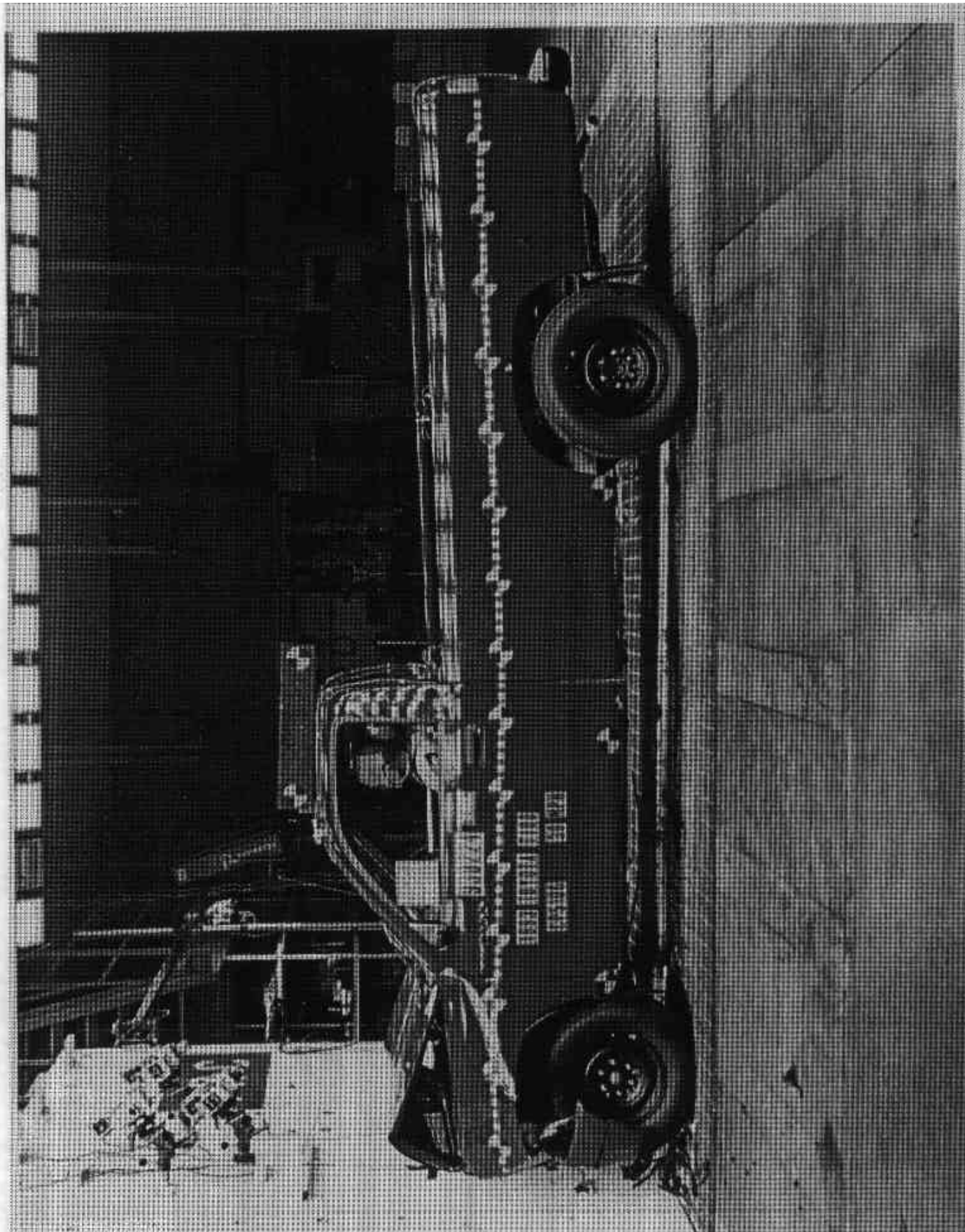


Figure A-4. POST-TEST LEFT SIDE VIEW
A-5

930224

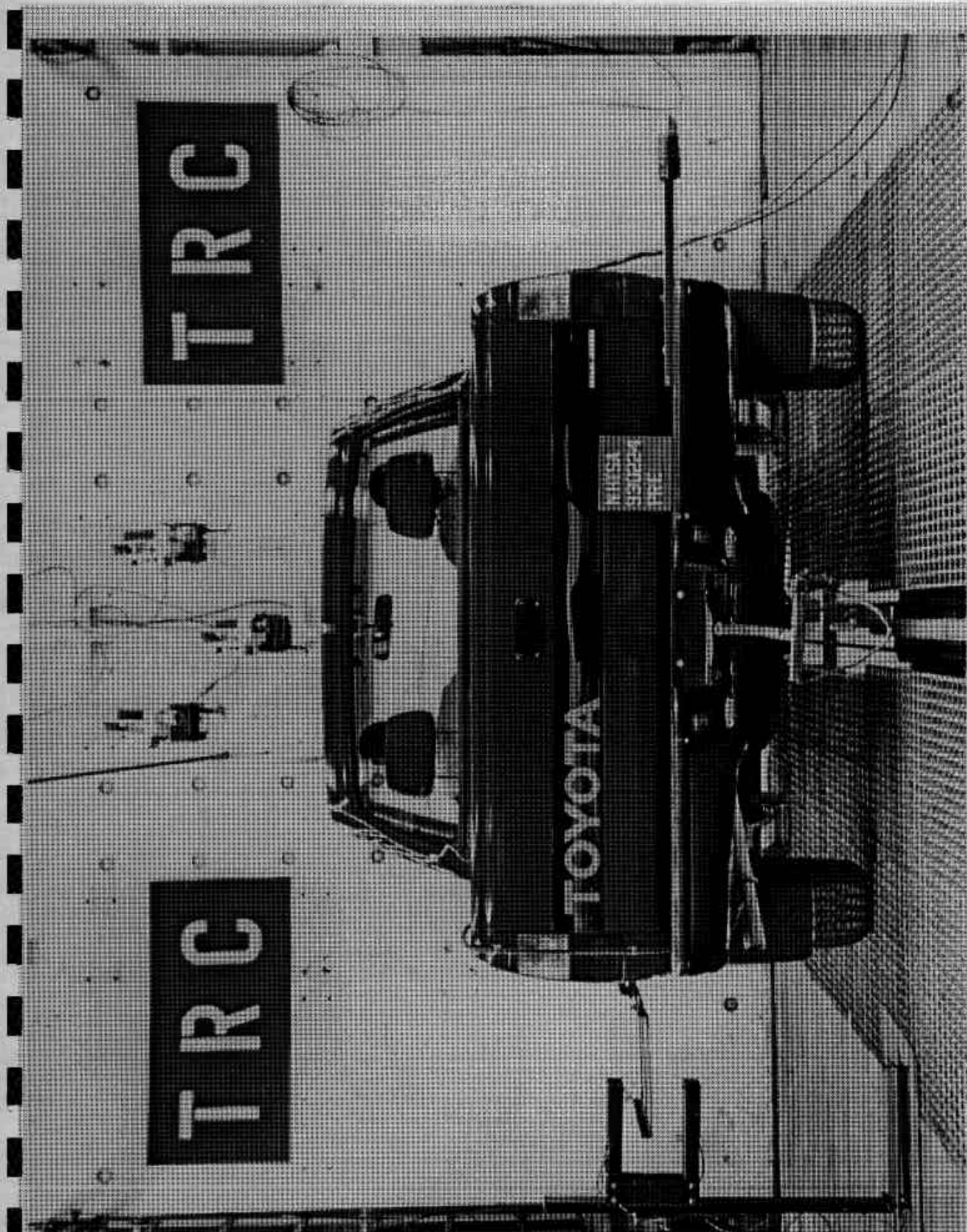


Figure A-5. PRE-TEST REAR VIEW

A-6

930224

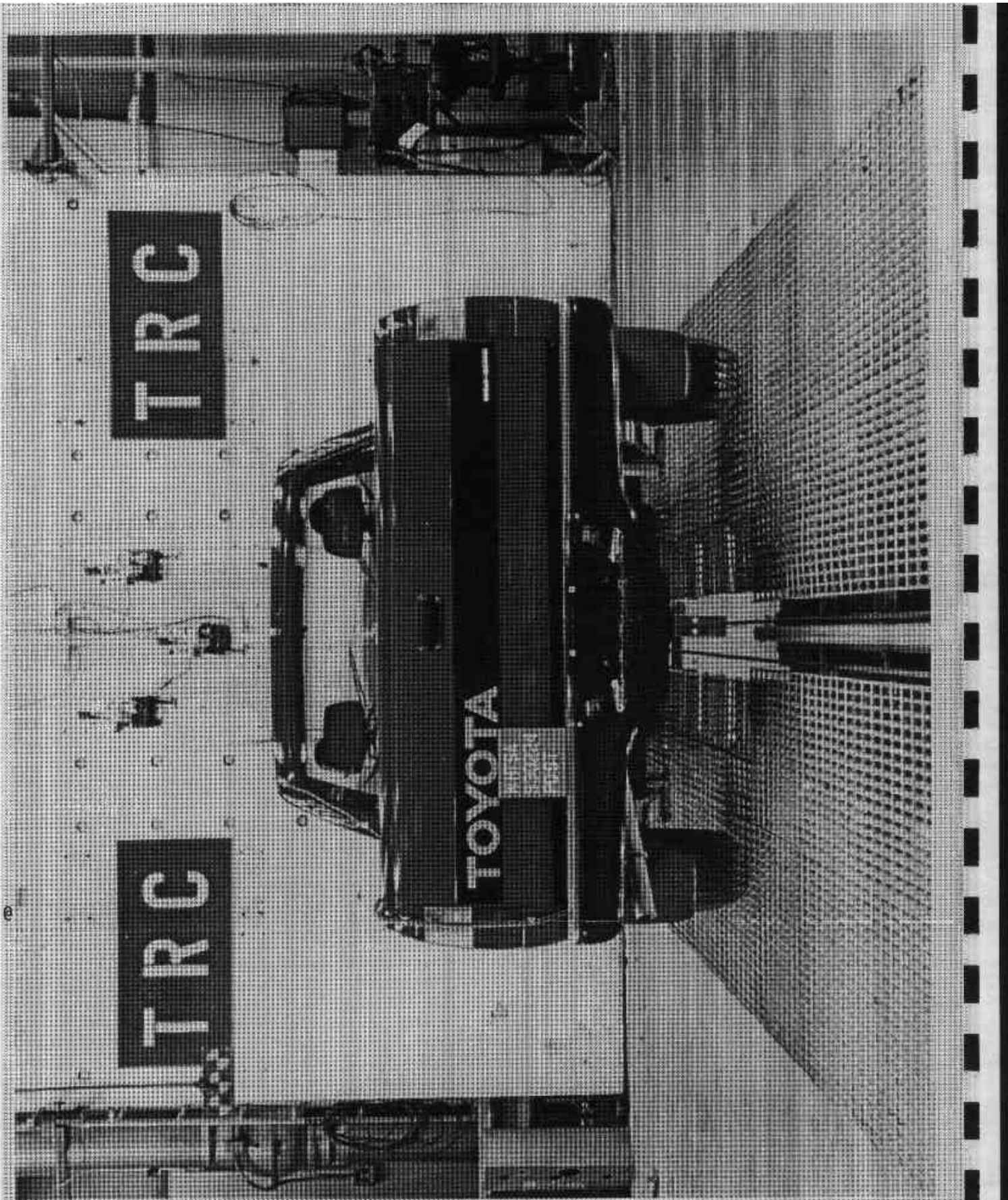


Figure A-6. POST-TEST REAR VIEW
A-7

930224

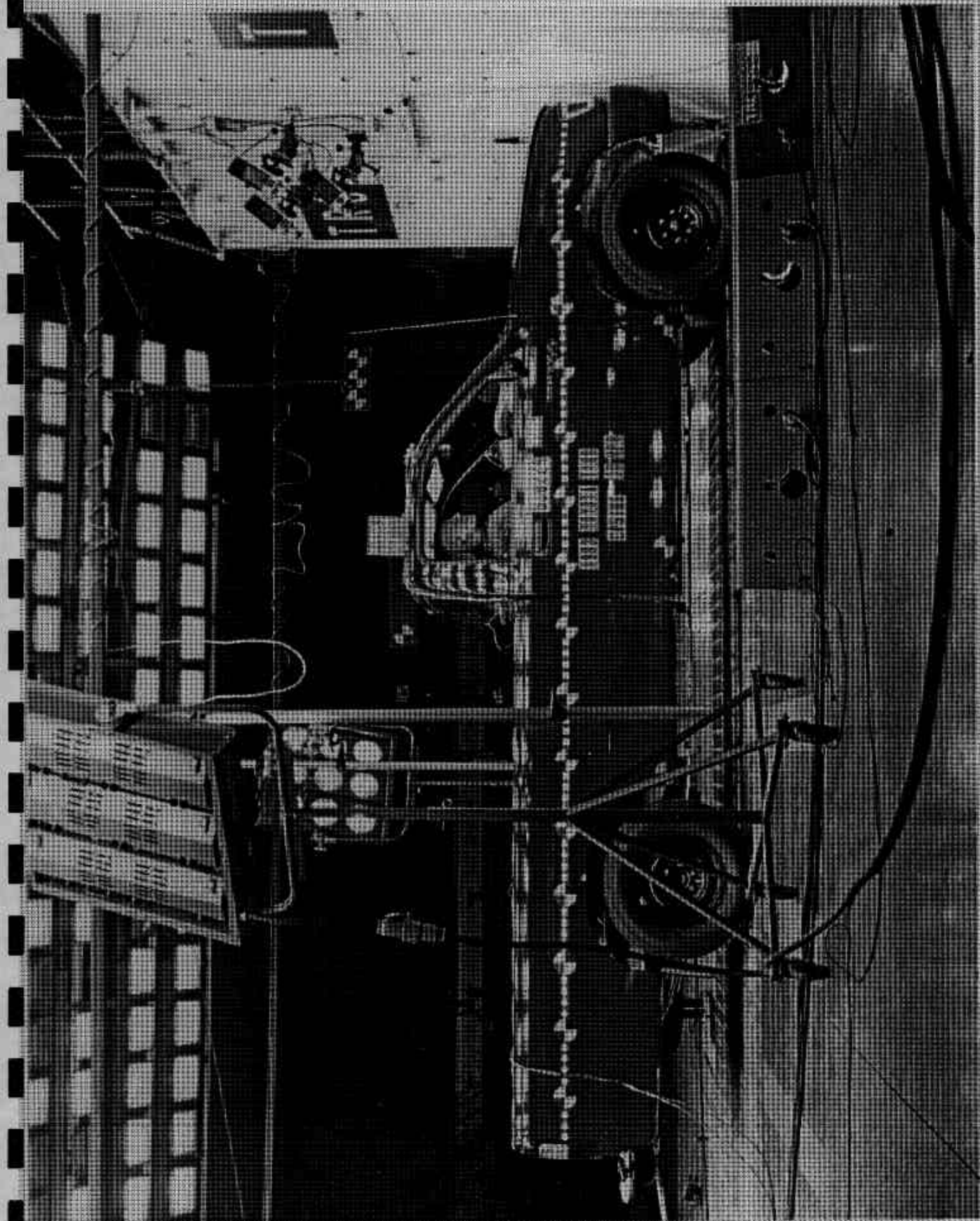


Figure A-7. PRE-TEST RIGHT SIDE VIEW

A-8

930224

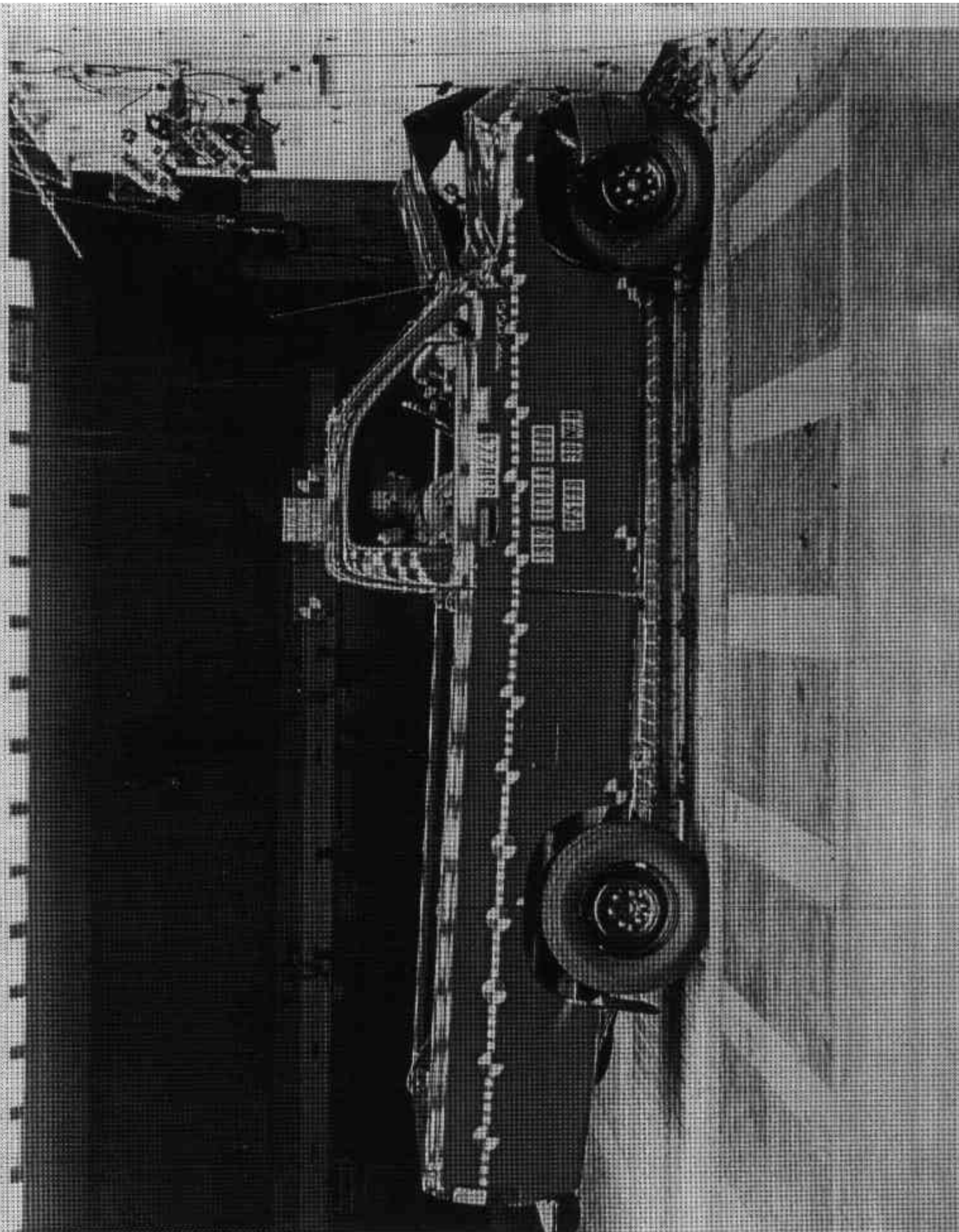


Figure A-8. POST-TEST RIGHT SIDE VIEW

A-9

930224



Figure A-9. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW

A-10

930224

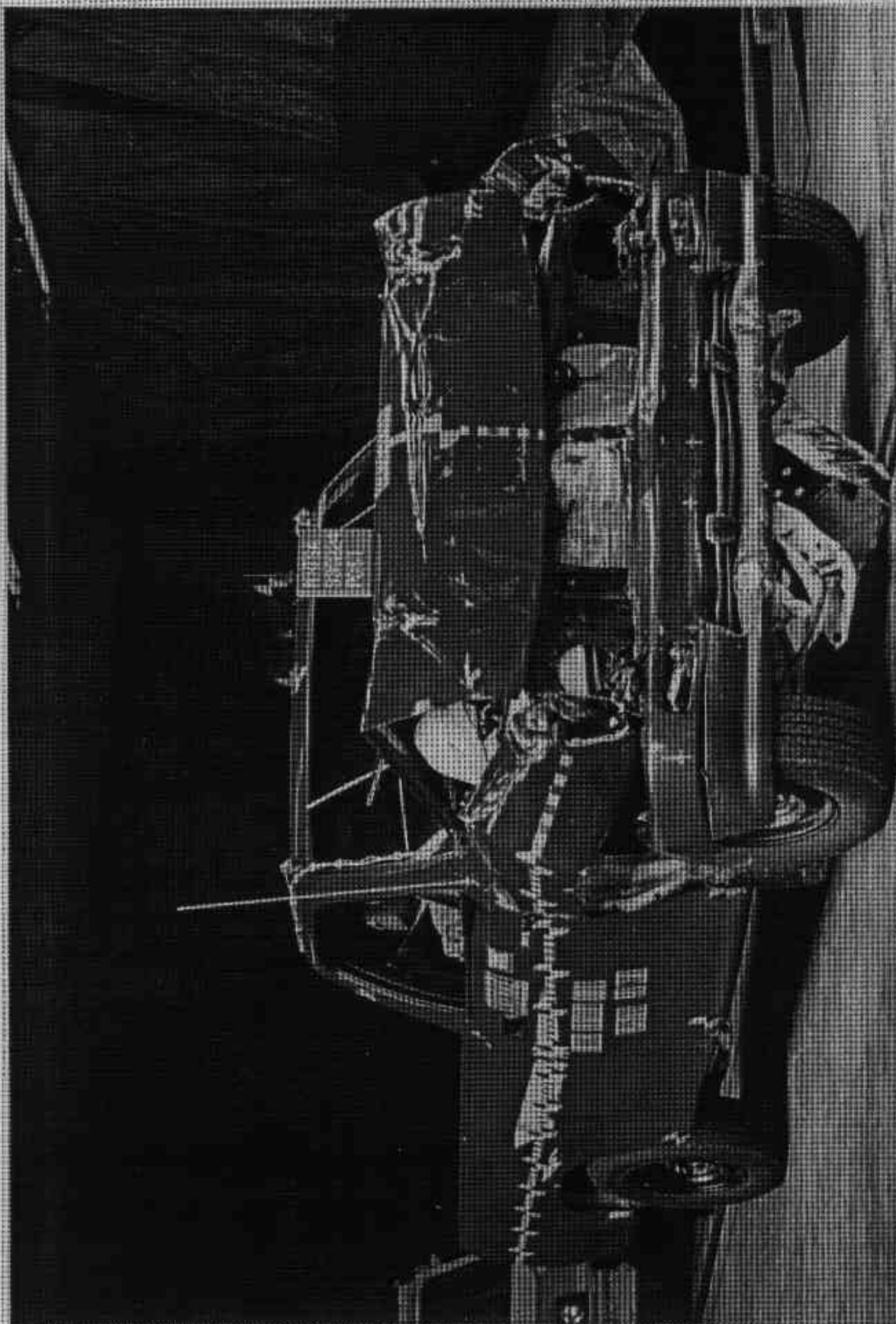


Figure A-10. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

A-11

930224

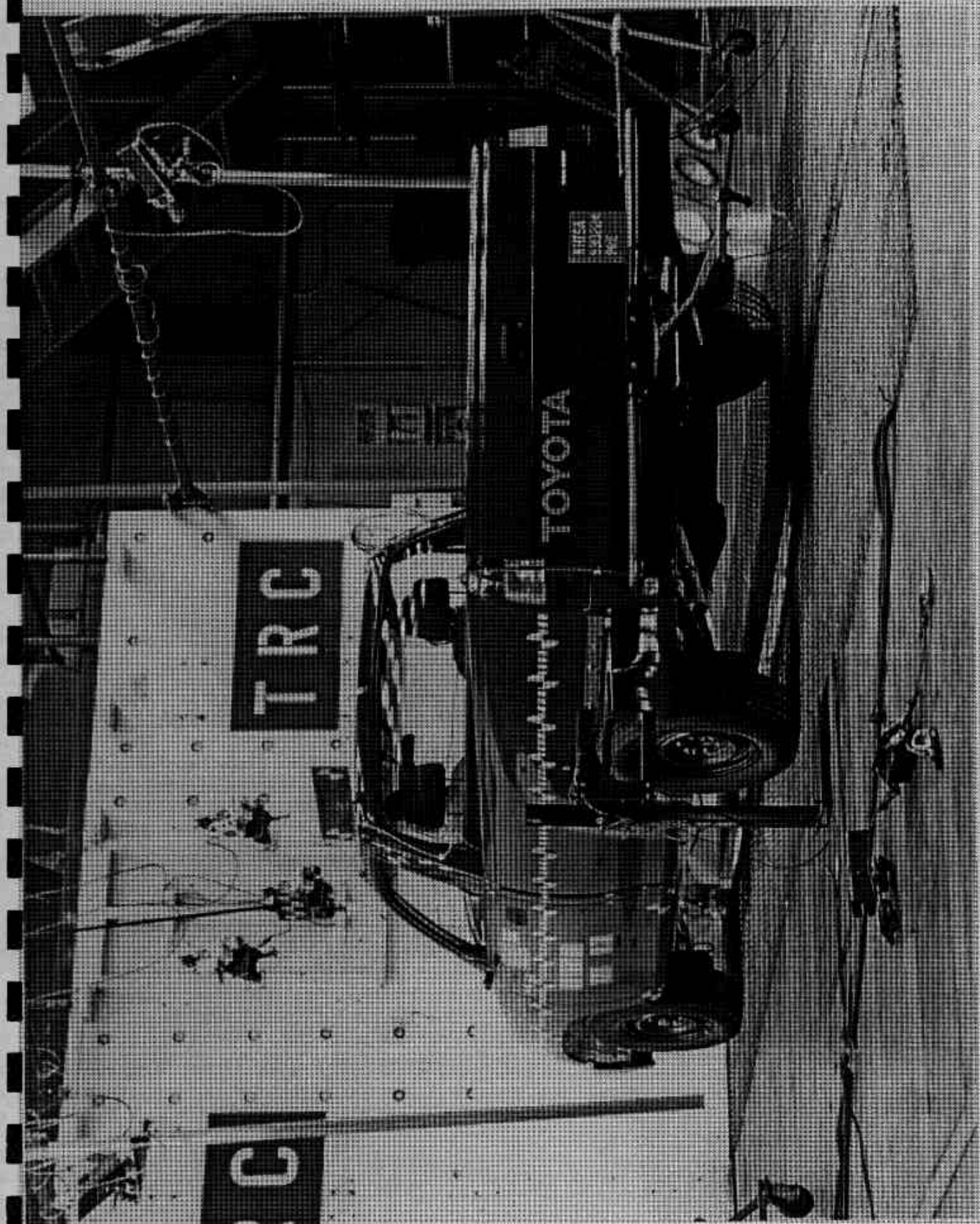


Figure A-11. PRE-TEST LEFT REAR THREE-QUARTER VIEW

A-12

930224

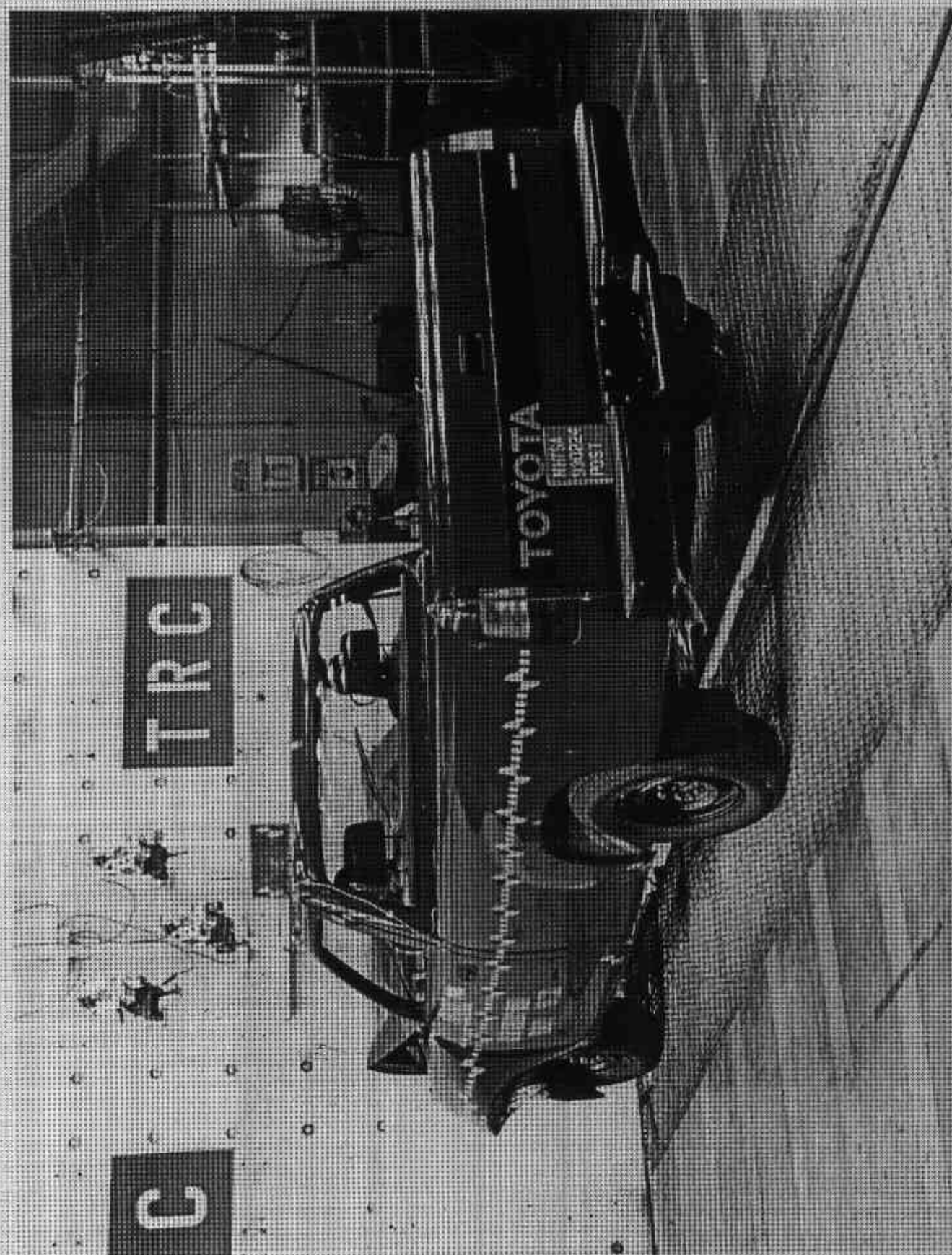


Figure A-12. POST-TEST LEFT REAR THREE-QUARTER VIEW

A-13

930224

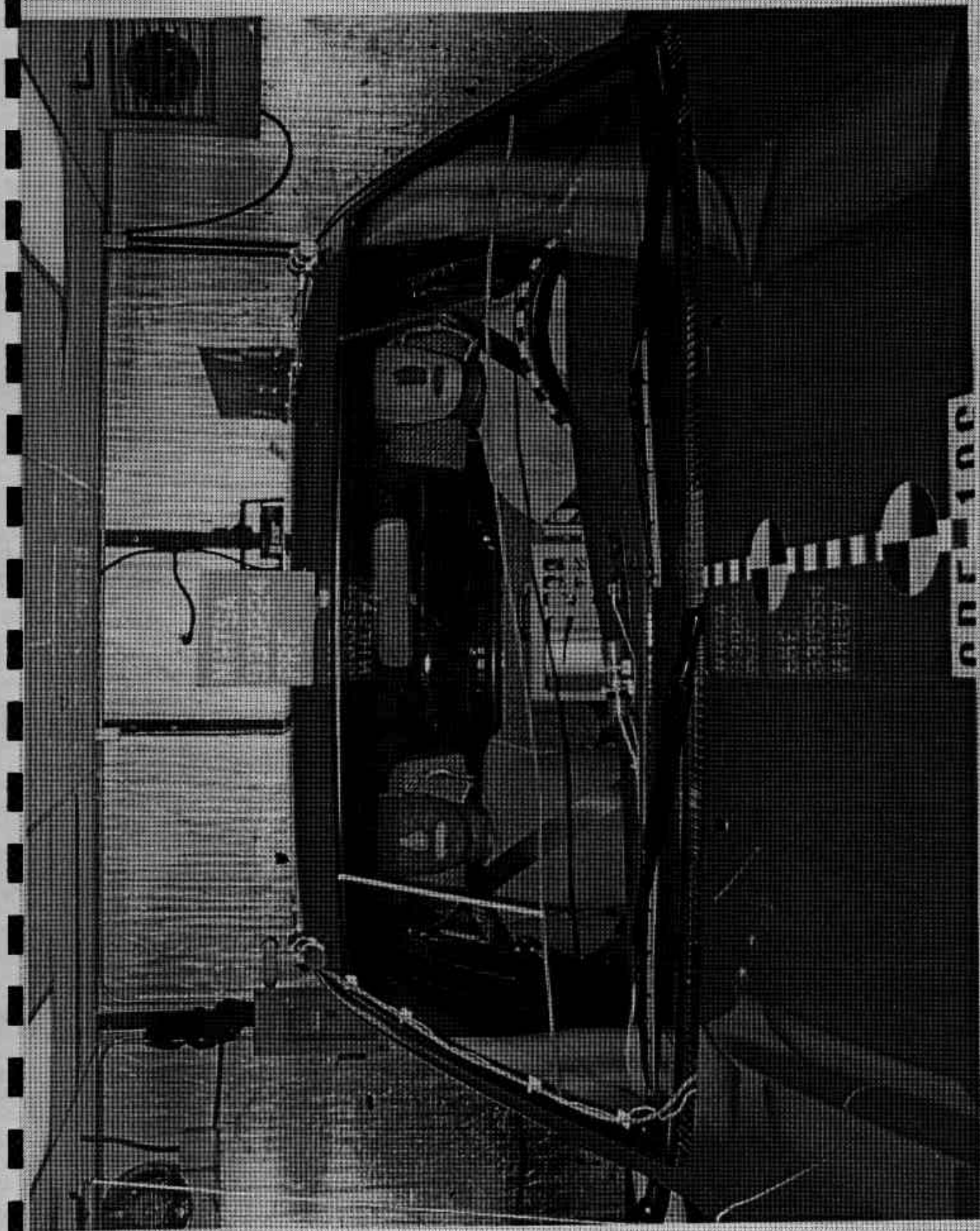


Figure A-13. PRE-TEST WINDSHIELD VIEW
A-14

930224

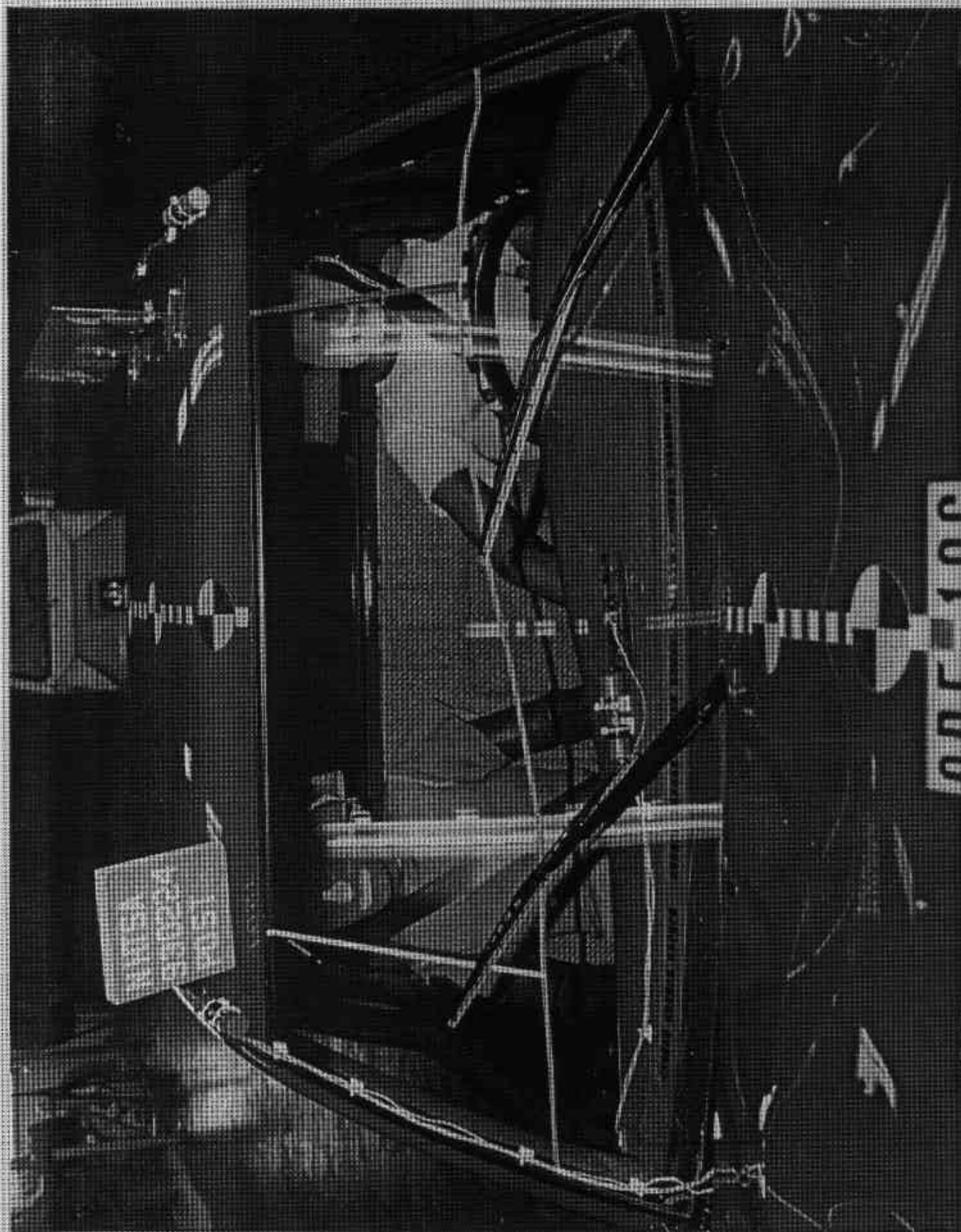


Figure A-14. POST-TEST WINDSHIELD VIEW
A-15

930224

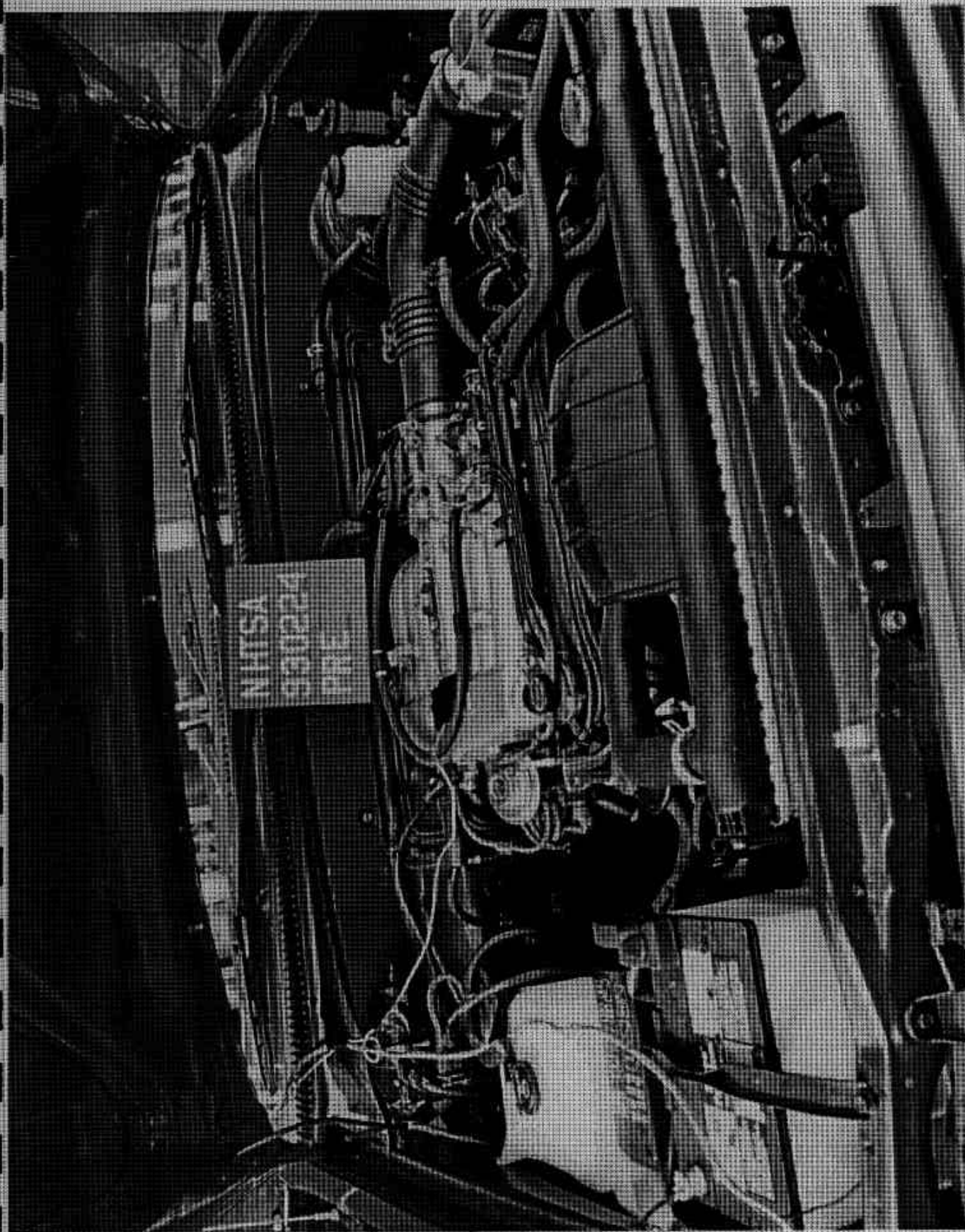


Figure A-15. PRE-TEST ENGINE COMPARTMENT VIEW

A-16

930224

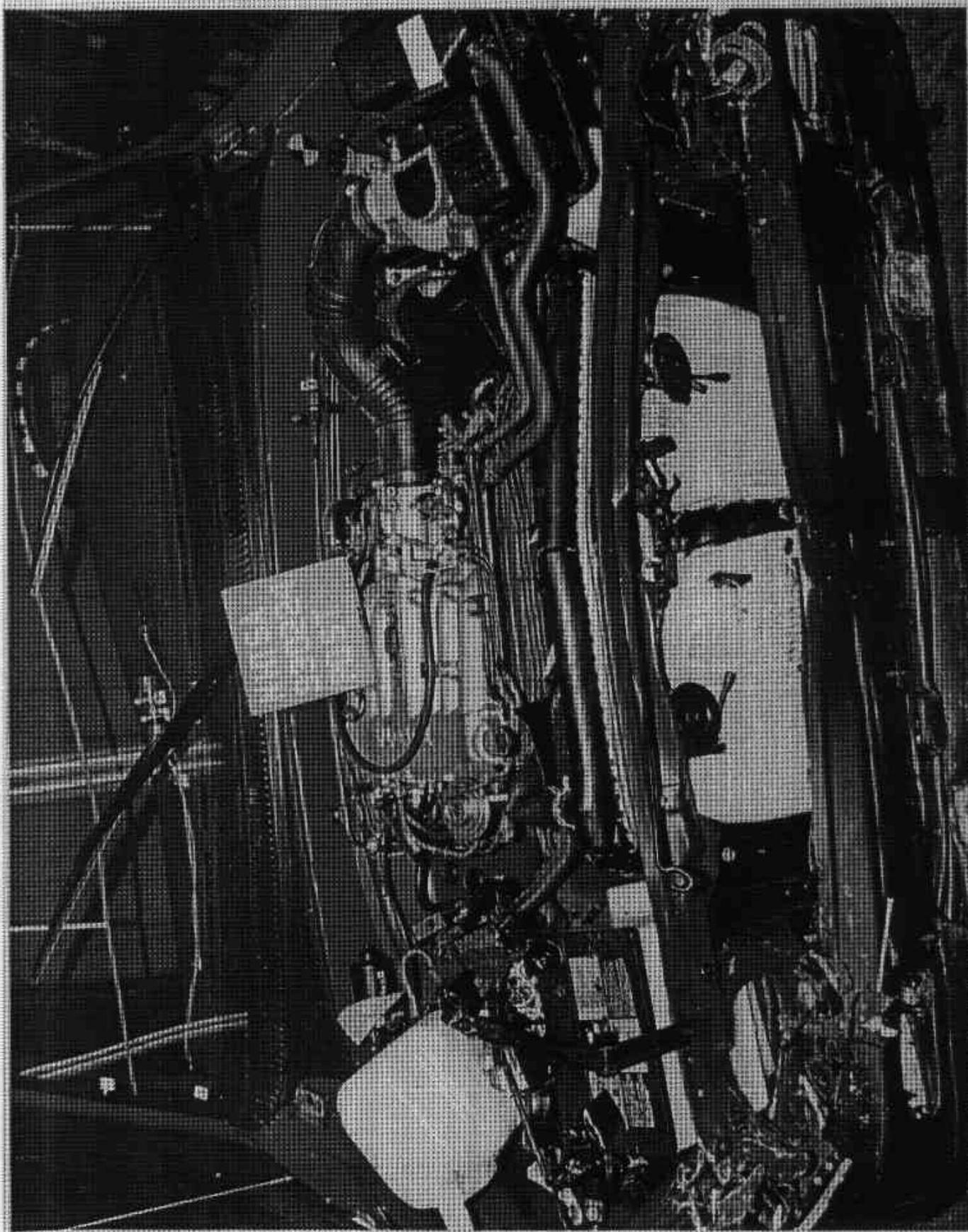


Figure A-16. POST-TEST ENGINE COMPARTMENT VIEW
A-17

930224

NHTSA
930224
PRE



Figure A-17. PRE-TEST FUEL FILLER CAP VIEW
A-18

930224



Figure A-18. POST-TEST FUEL FILLER CAP VIEW

A-19

930224

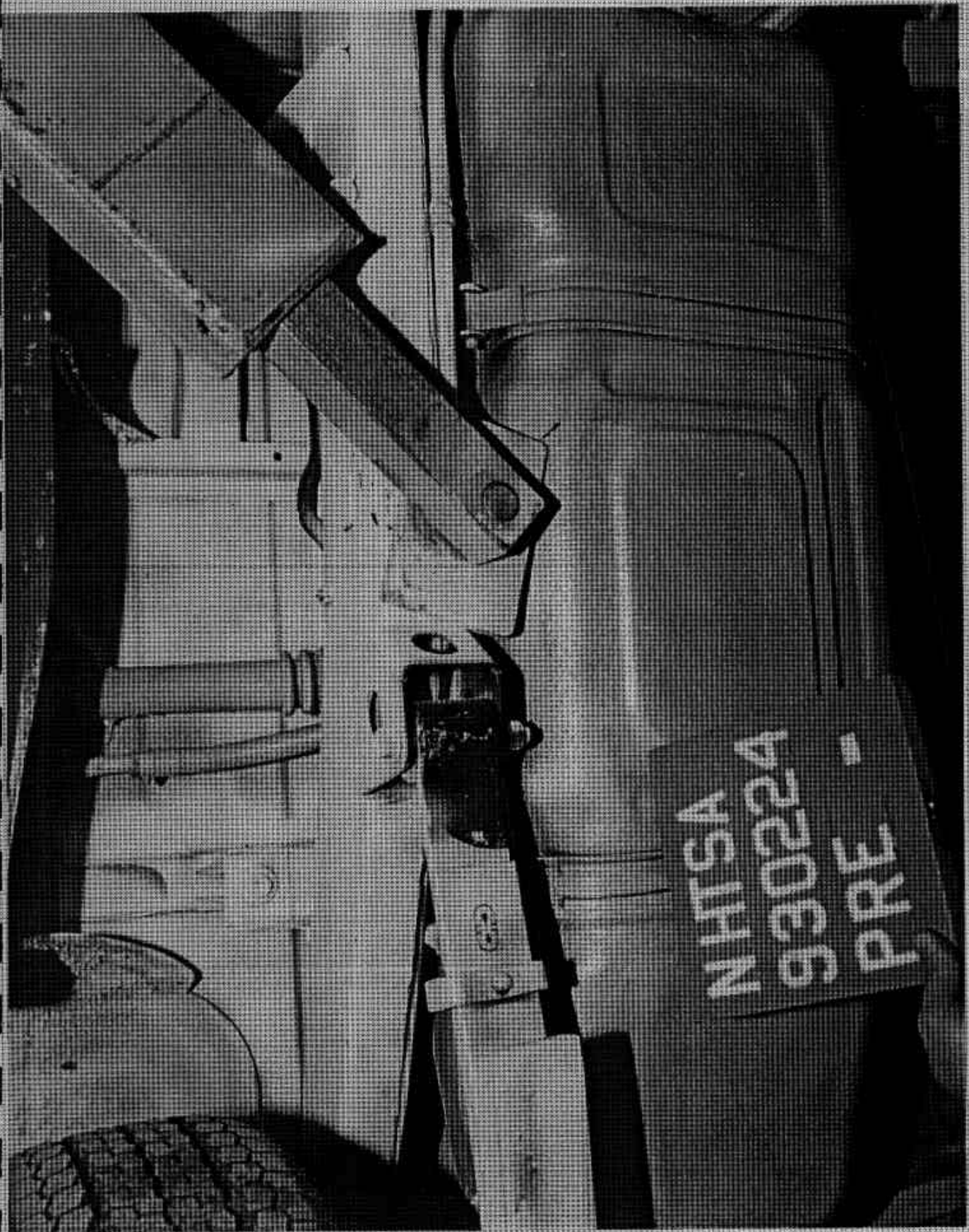


Figure A-19. PRE-TEST FUEL FILLER NECK & FUEL TANK VIEW

A-20

930224



Figure A-20. POST-TEST FUEL FILLER NECK VIEW
A-21

930224



Figure A-21. POST-TEST FUEL TANK VIEW

A-22

930224

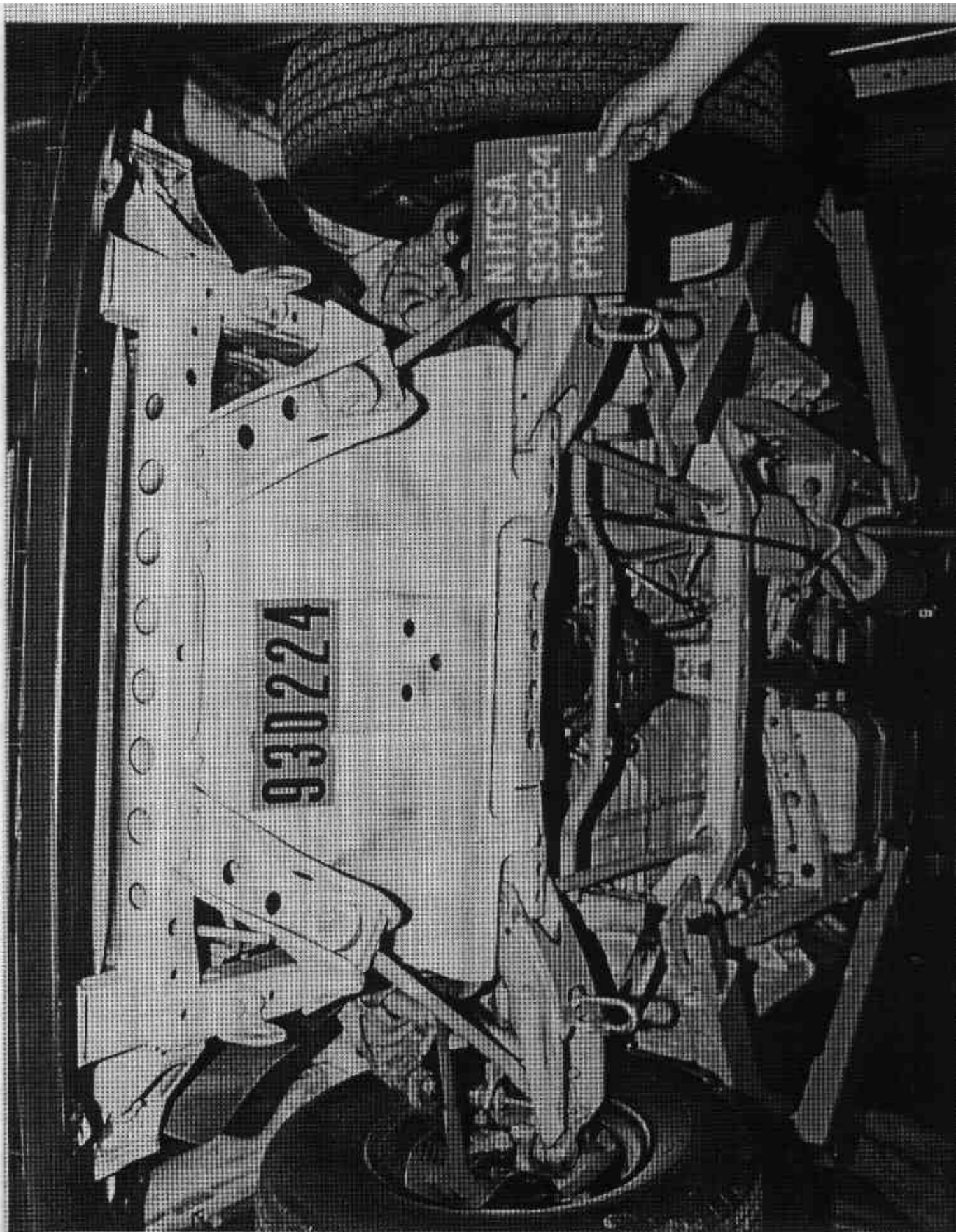


Figure A-22. PRE-TEST FRONT UNDERBODY VIEW
A-23

930224

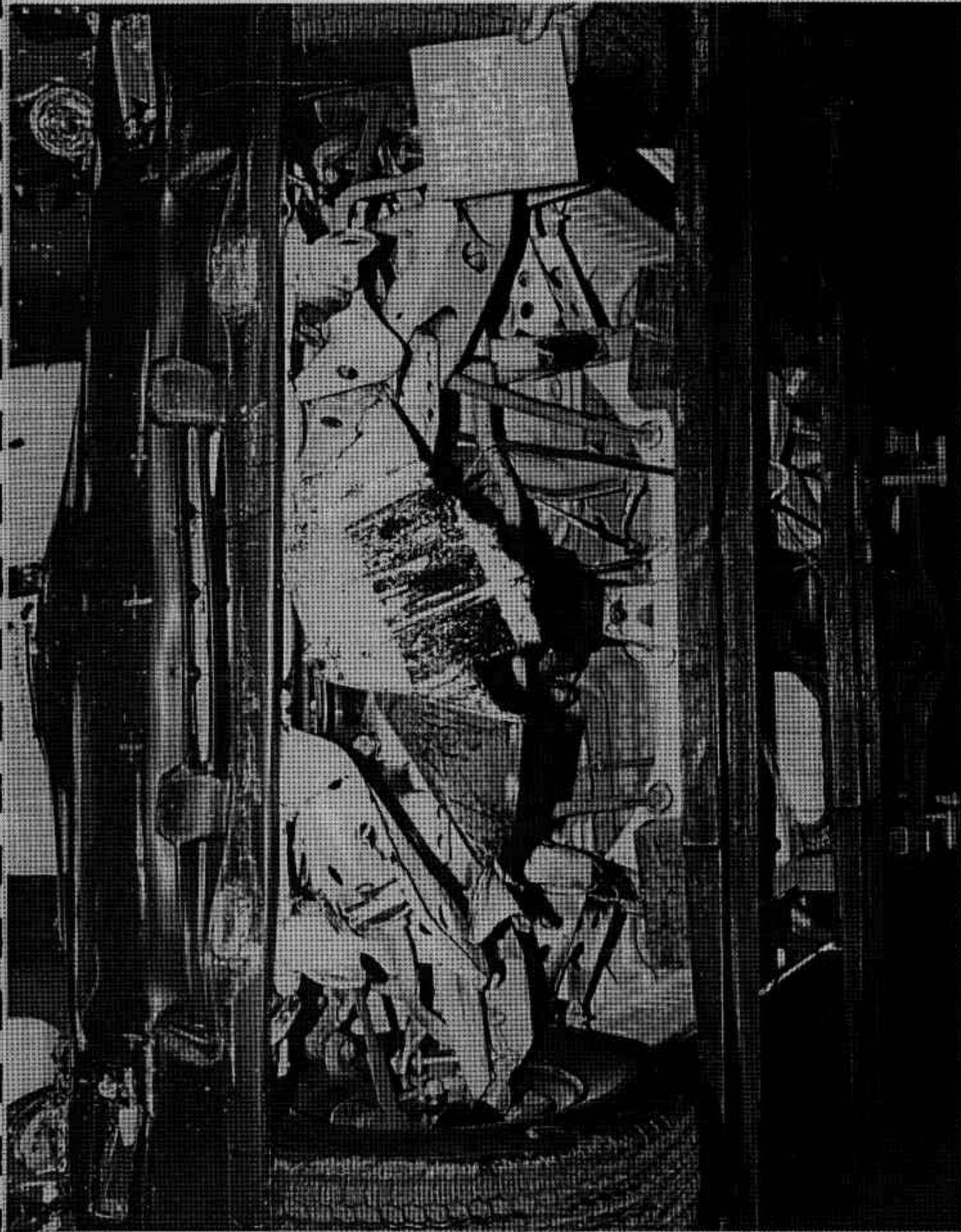


Figure A-23. POST-TEST FRONT UNDERBODY VIEW

A-24

930224

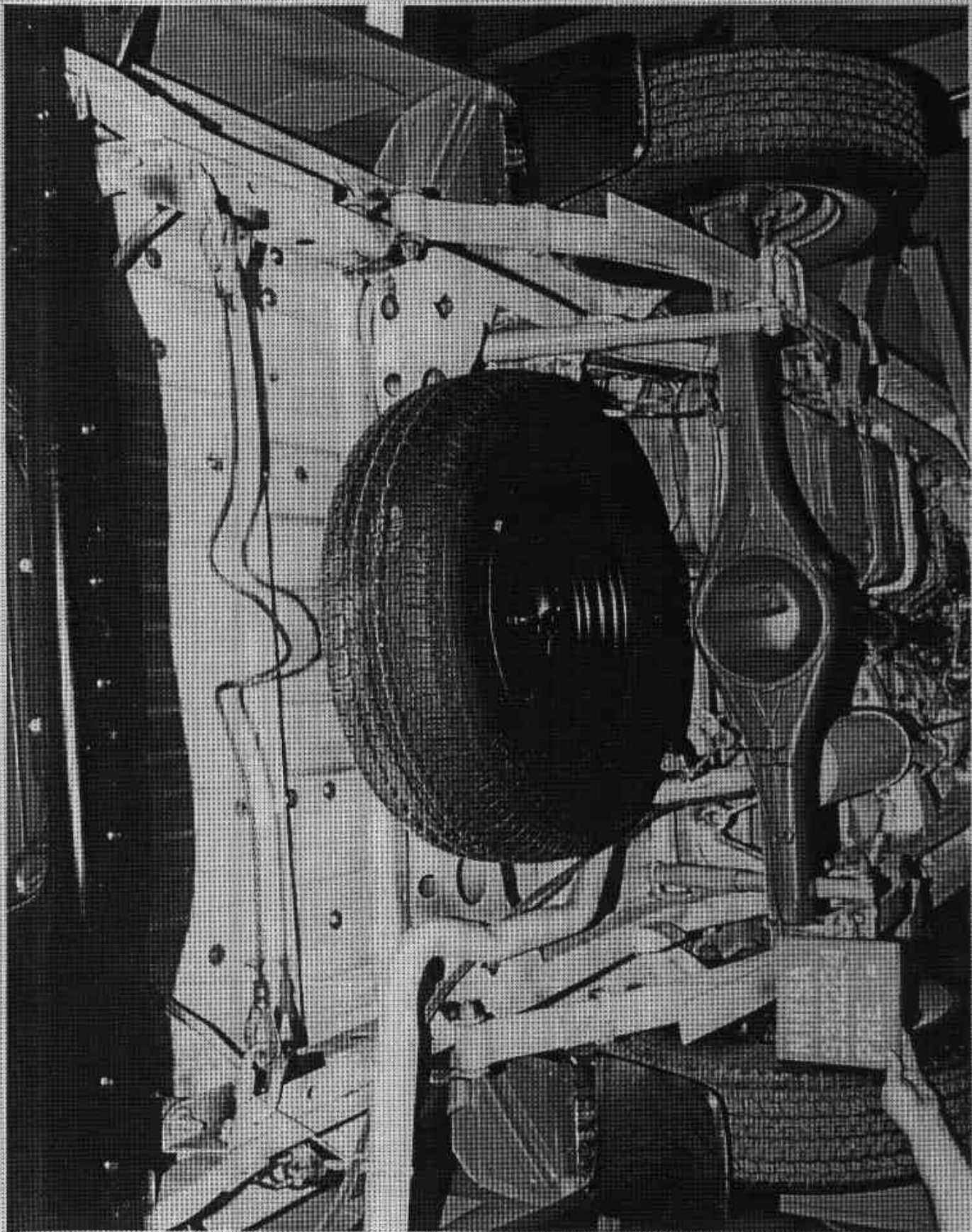


Figure A-24. PRE-TEST REAR UNDERBODY VIEW
A-25

930224

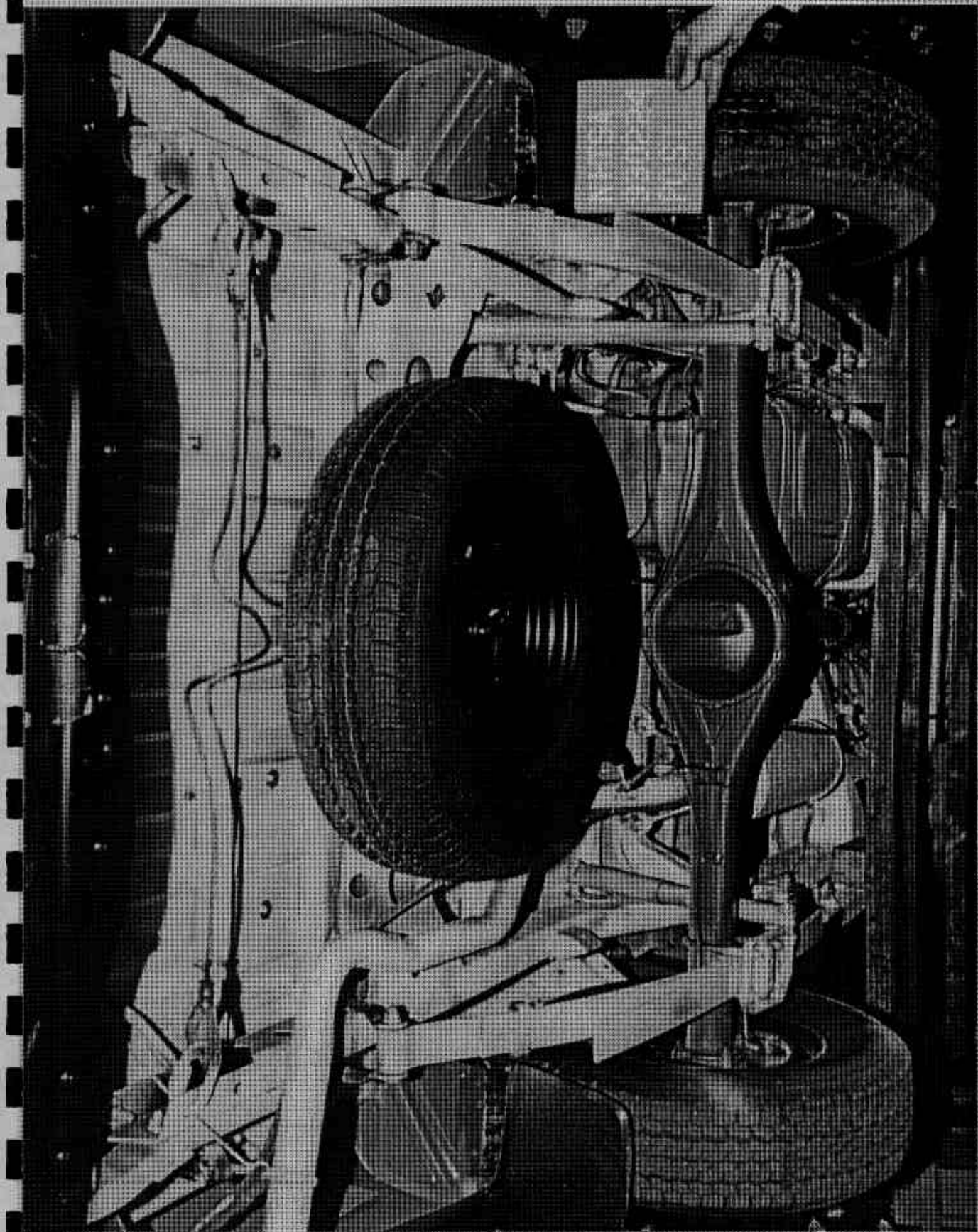


Figure A-25. POST-TEST REAR UNDERBODY VIEW
A-26

930224

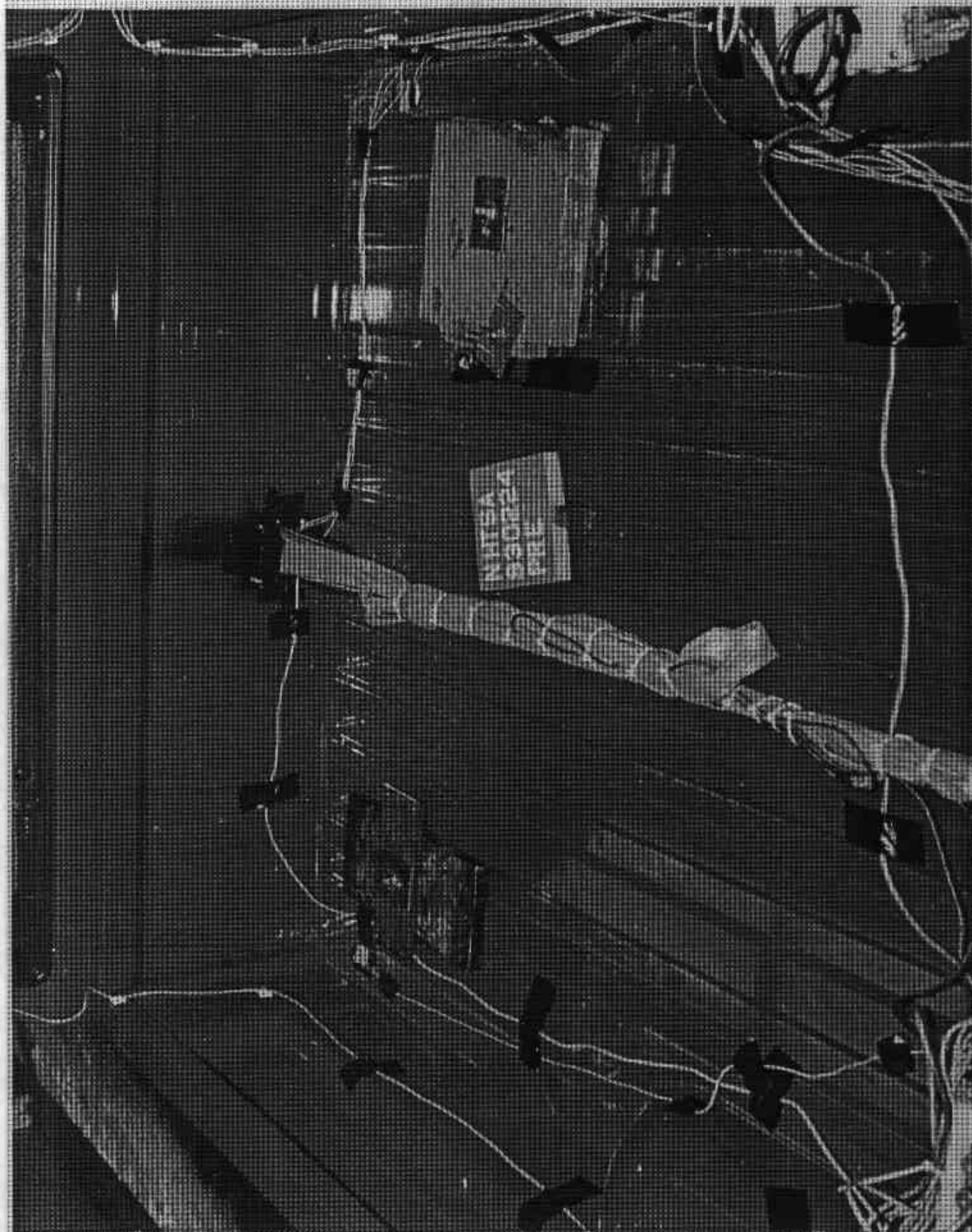


Figure A-26. PRE-TEST BALLAST LOCATION VIEW
A-27

930224



Figure A-27. PRE-TEST DRIVER DUMMY POSITION VIEW

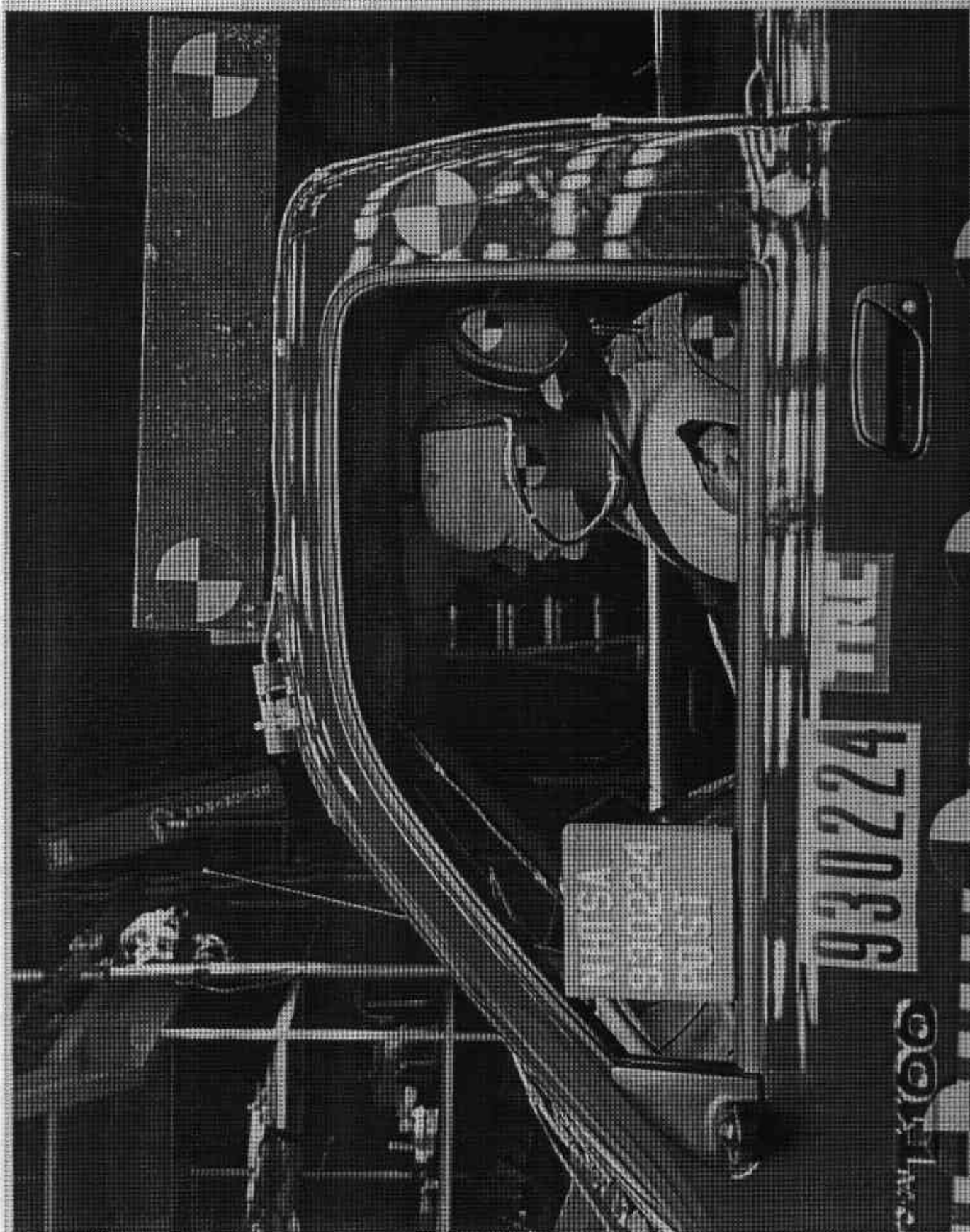


Figure A-28. POST-TEST DRIVER DUMMY POSITION VIEW

A-29

930224

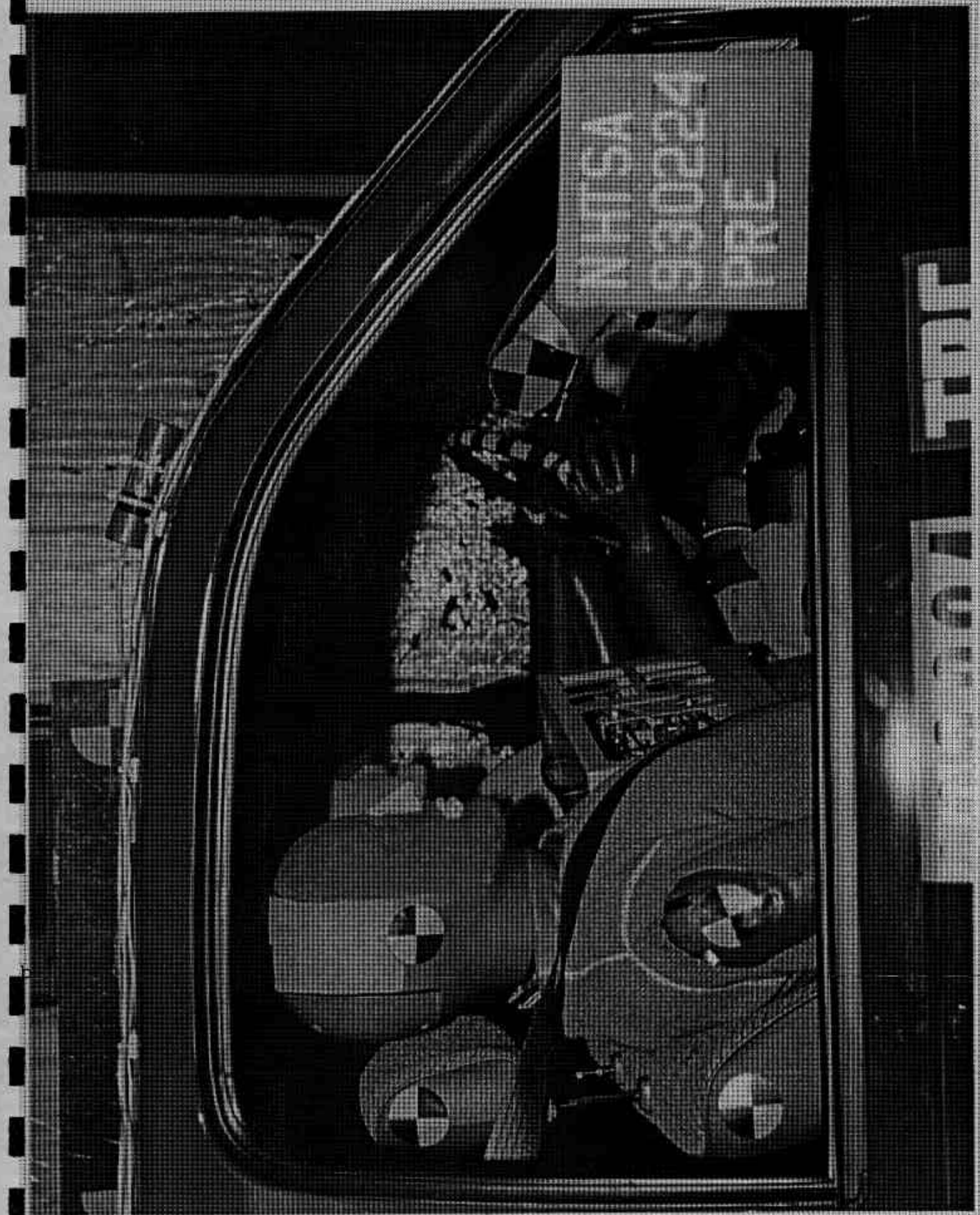


Figure A-29. PRE-TEST PASSENGER DUMMY POSITION VIEW

A-30

930224

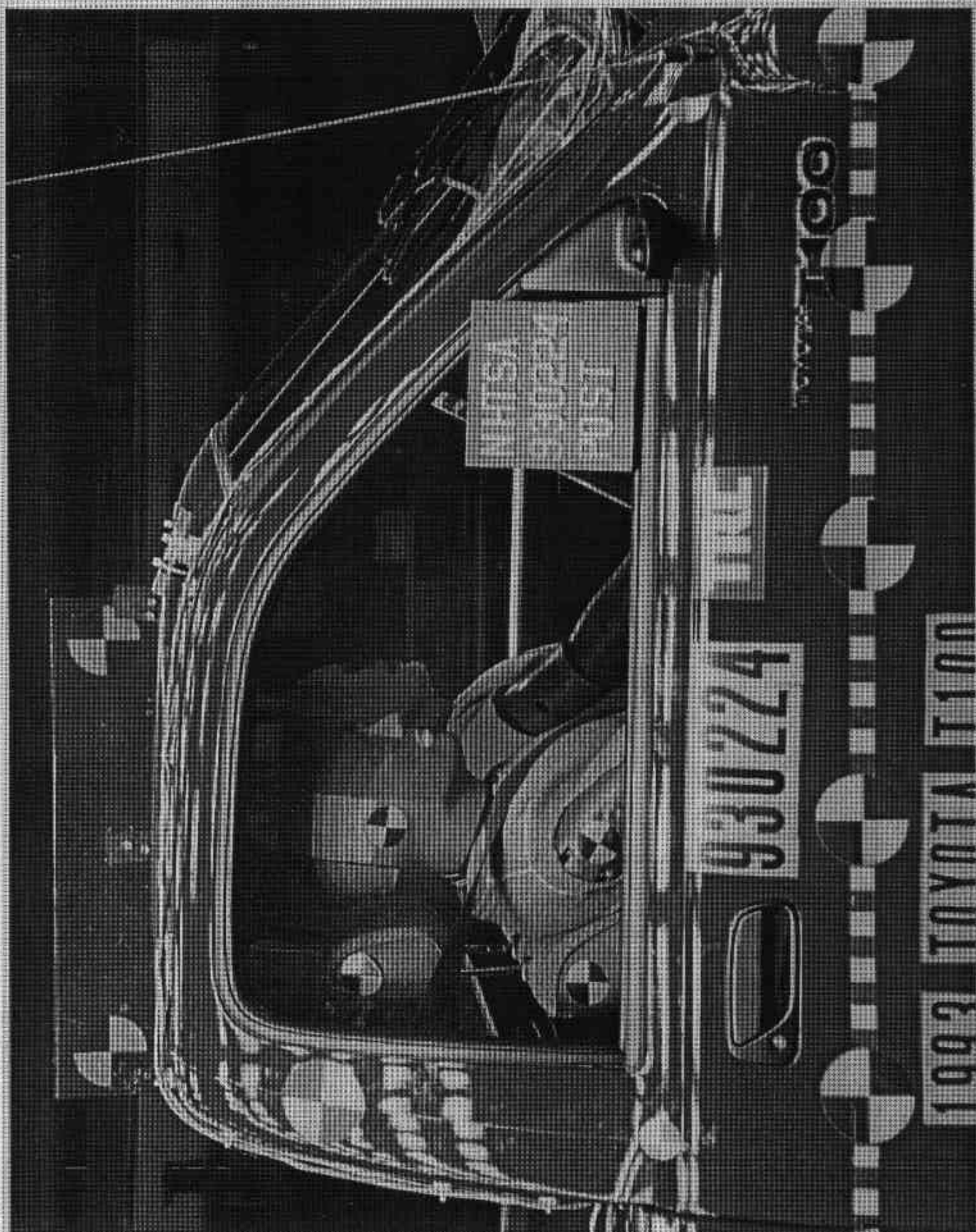


Figure A-30. POST-TEST PASSENGER DUMMY POSITION VIEW



Figure A-31. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1
A-32 930224

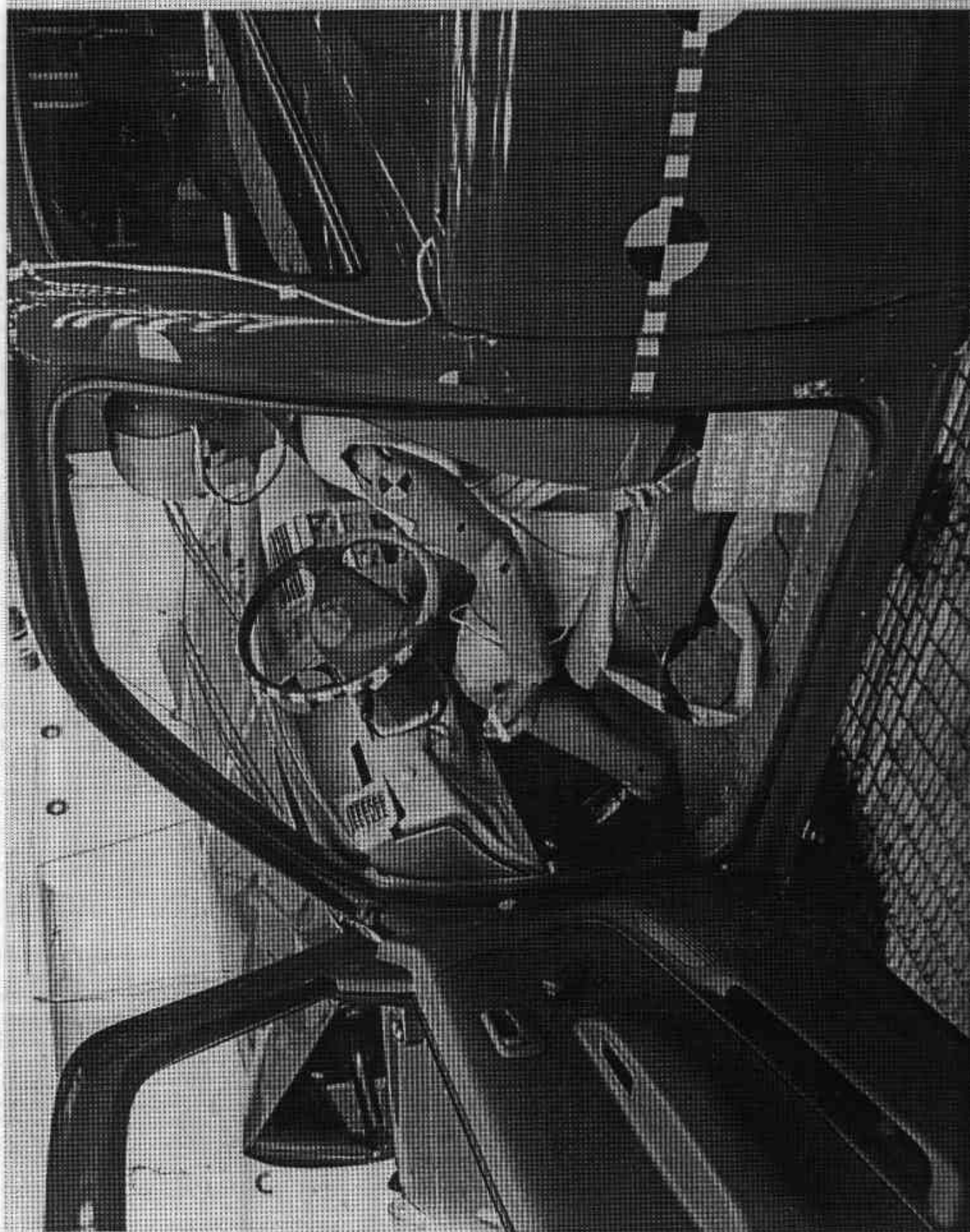


Figure A-32. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1

A-33

930224

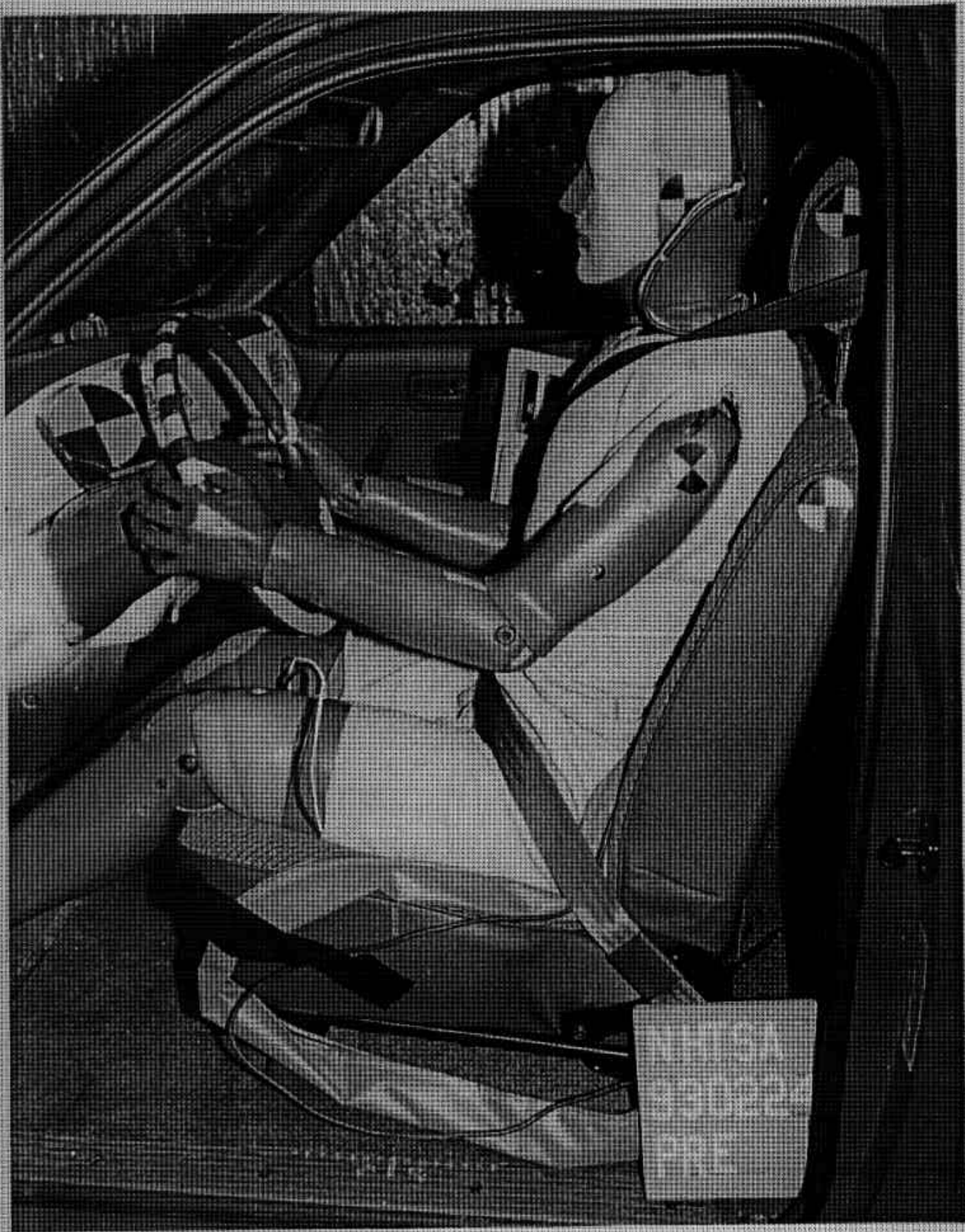


Figure A-33. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2

A-34

930224



Figure A-34. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2
A-35 930224

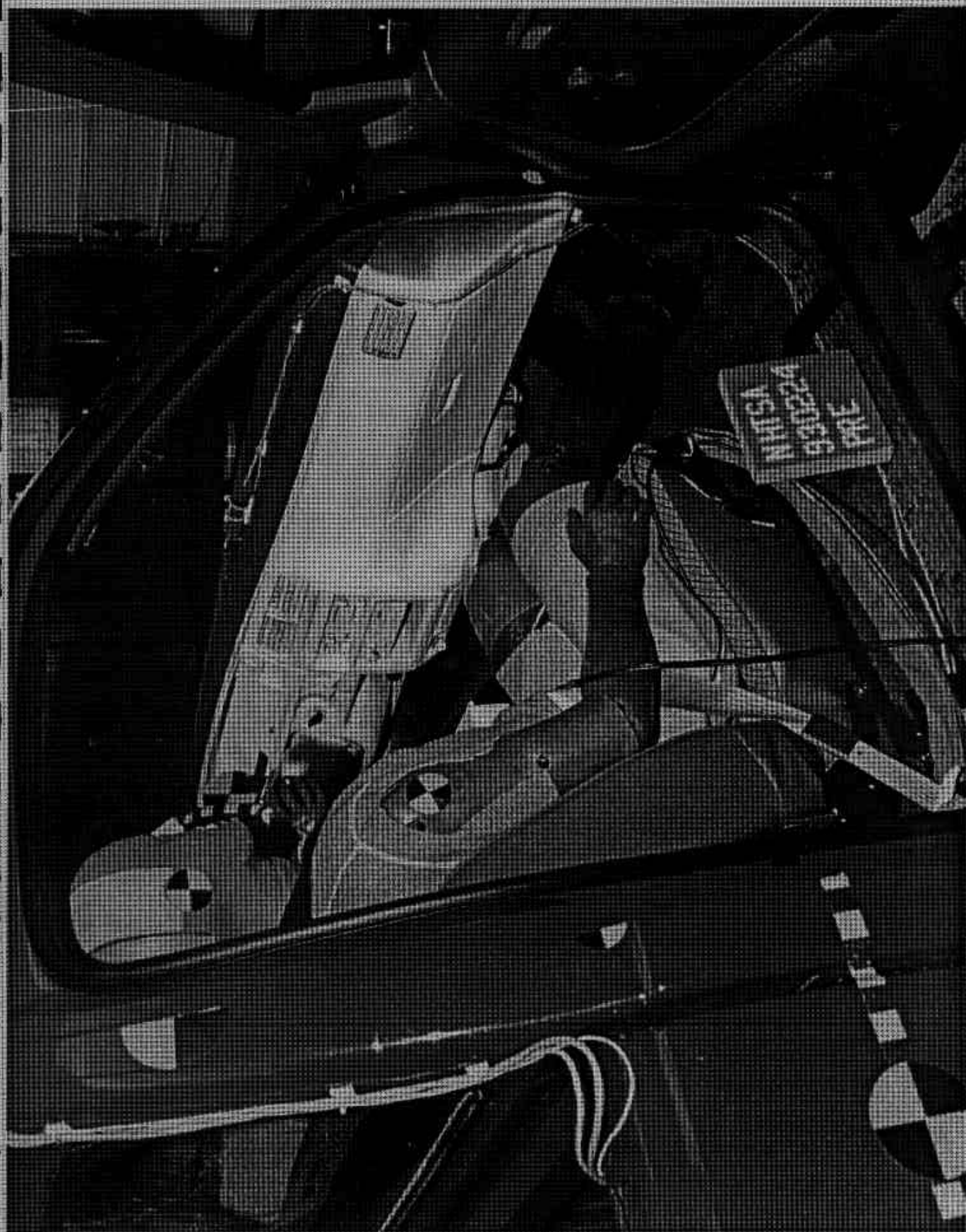


Figure A-35. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1



Figure A-36. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1

A-37

930224

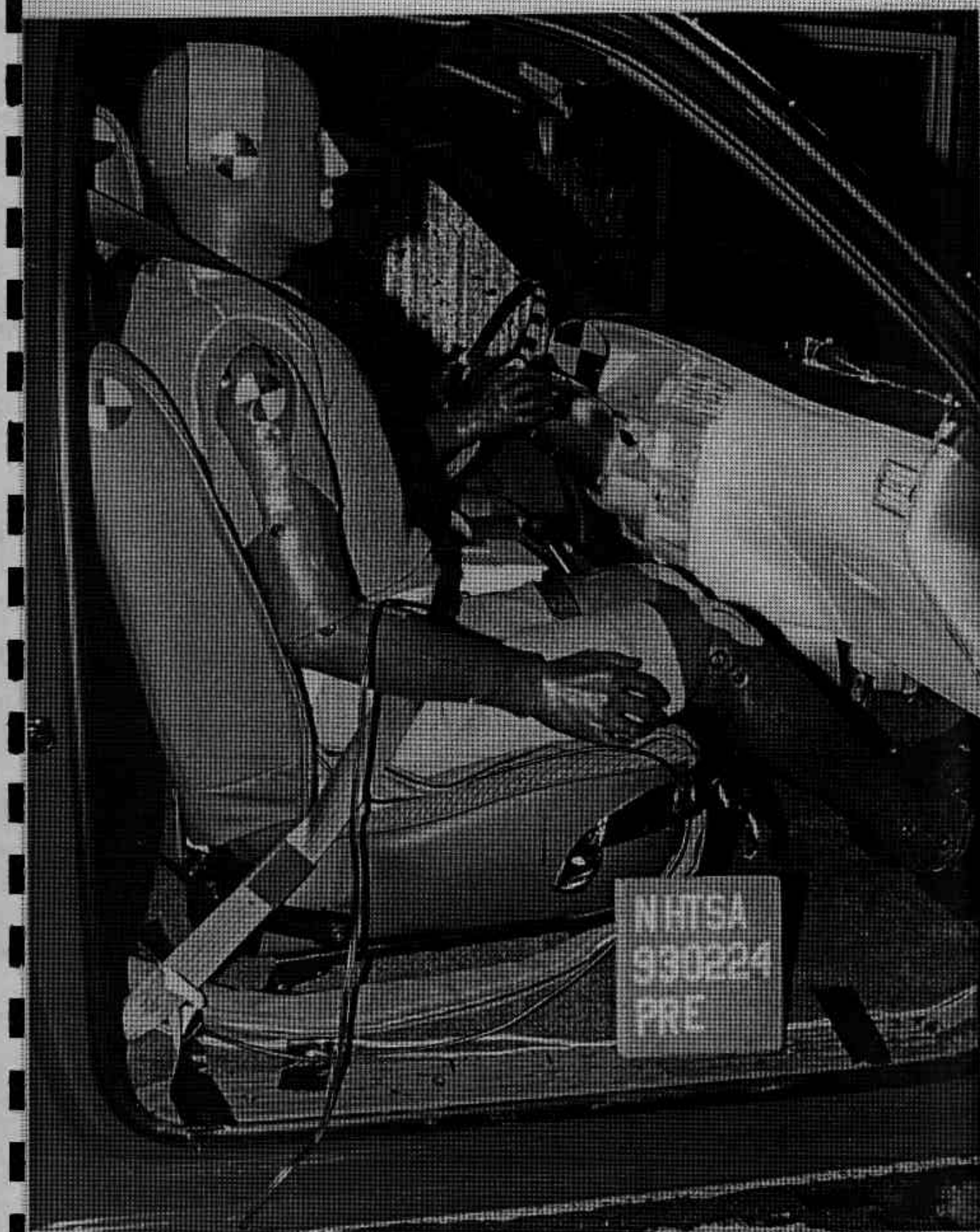


Figure A-37. PRE-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2



Figure A-38. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2

A-39

930224

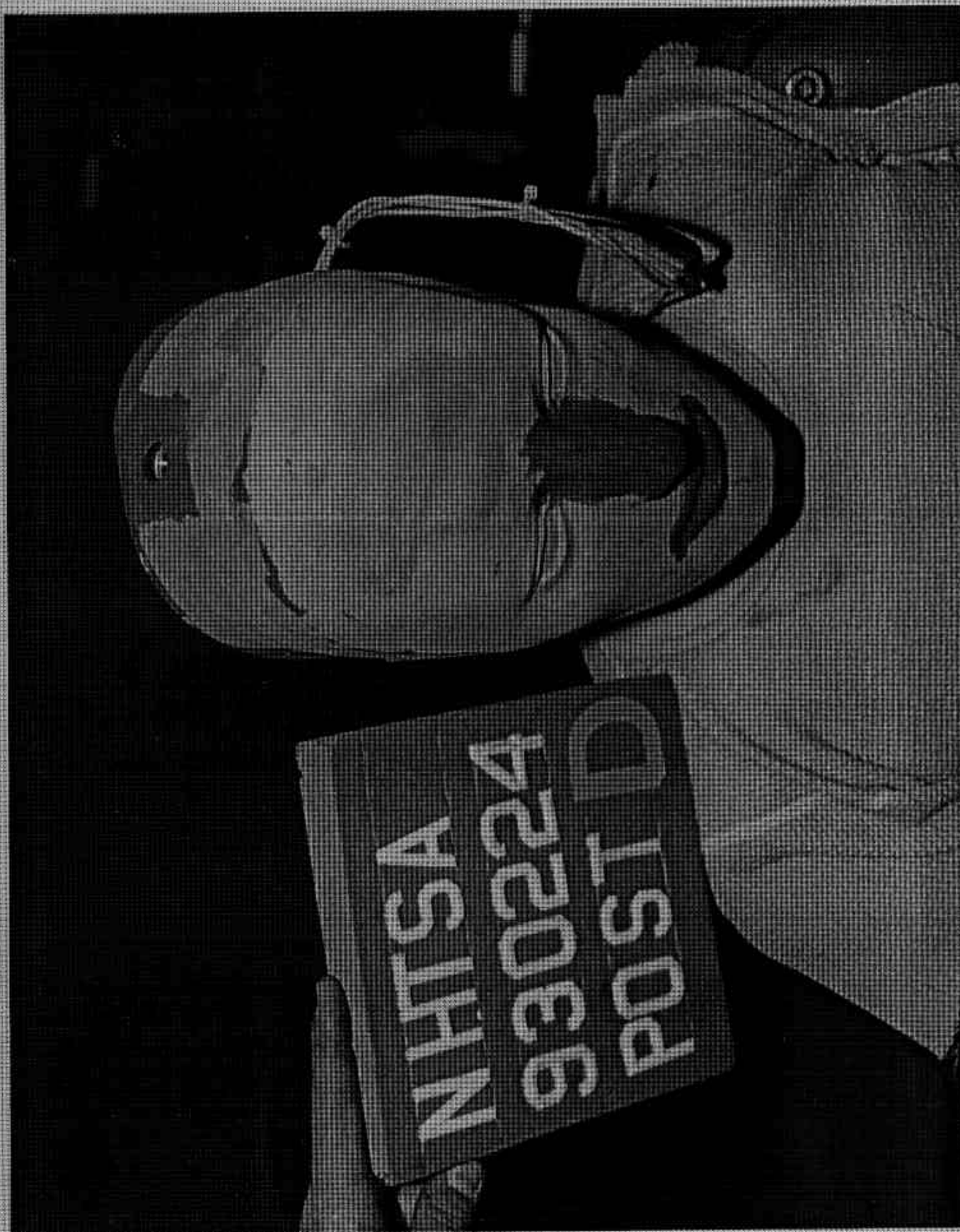


Figure A-39. POST-TEST DRIVER DUMMY HEAD CONTACT VIEW

A-40

930224

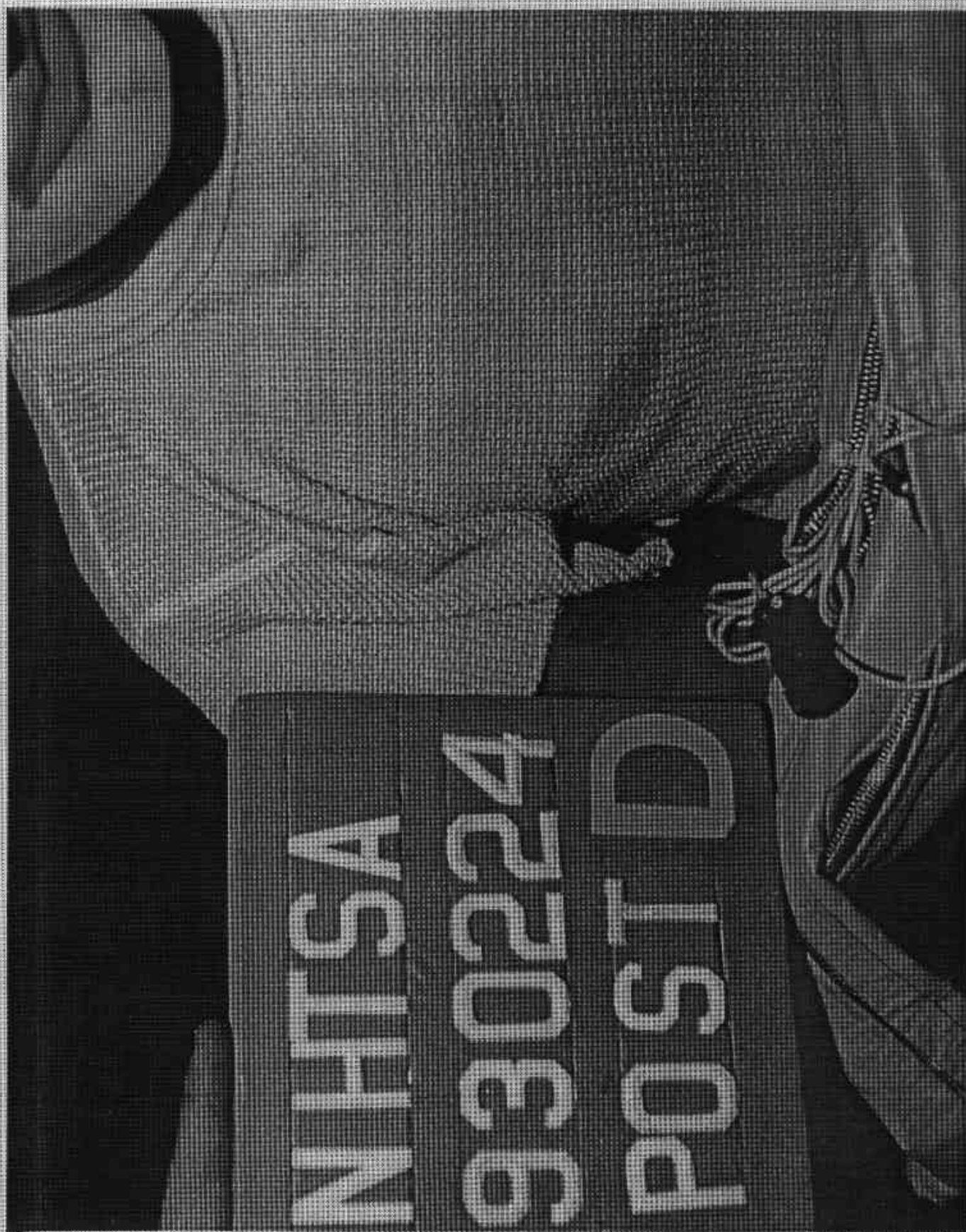


Figure A-40. POST-TEST DRIVER DUMMY HEAD & CHEST CONTACT-VIEW 1

A-41

930224

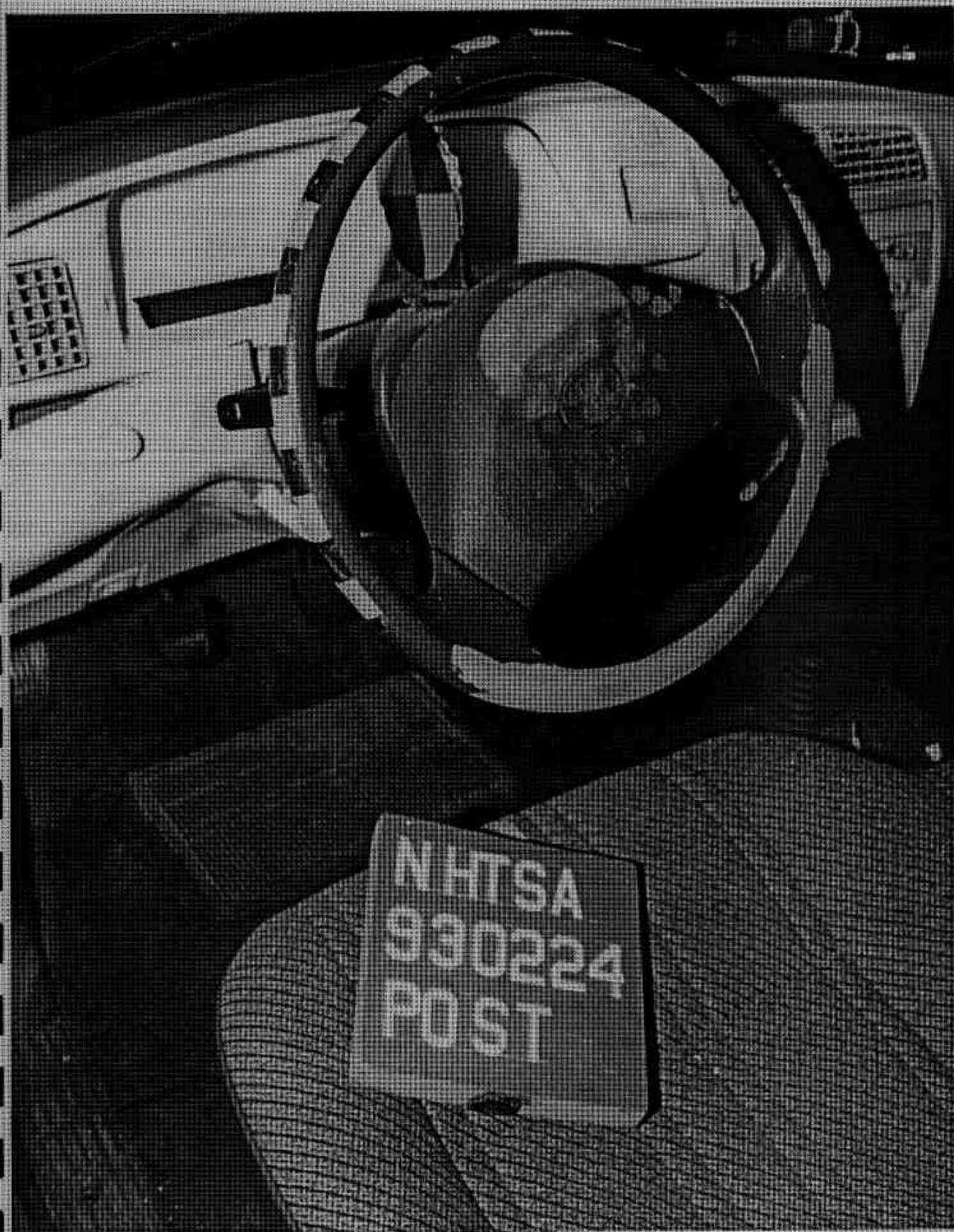


Figure A-41. POST-TEST DRIVER DUMMY HEAD & CHEST CONTACT-VIEW 2

A-42

930224

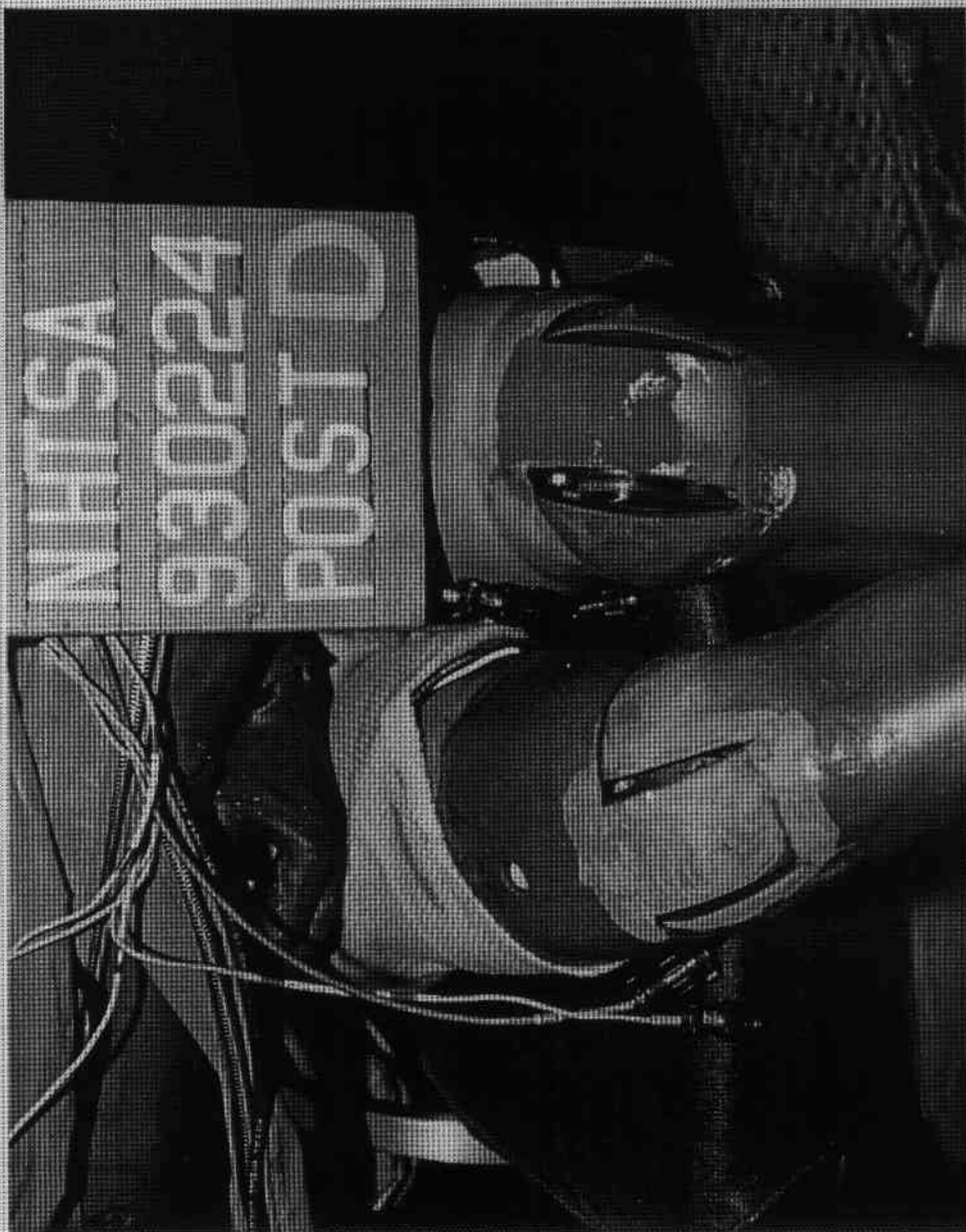


Figure A-42. POST-TEST DRIVER DUMMY KNEE CONTACT - VIEW 1

A-43

930224

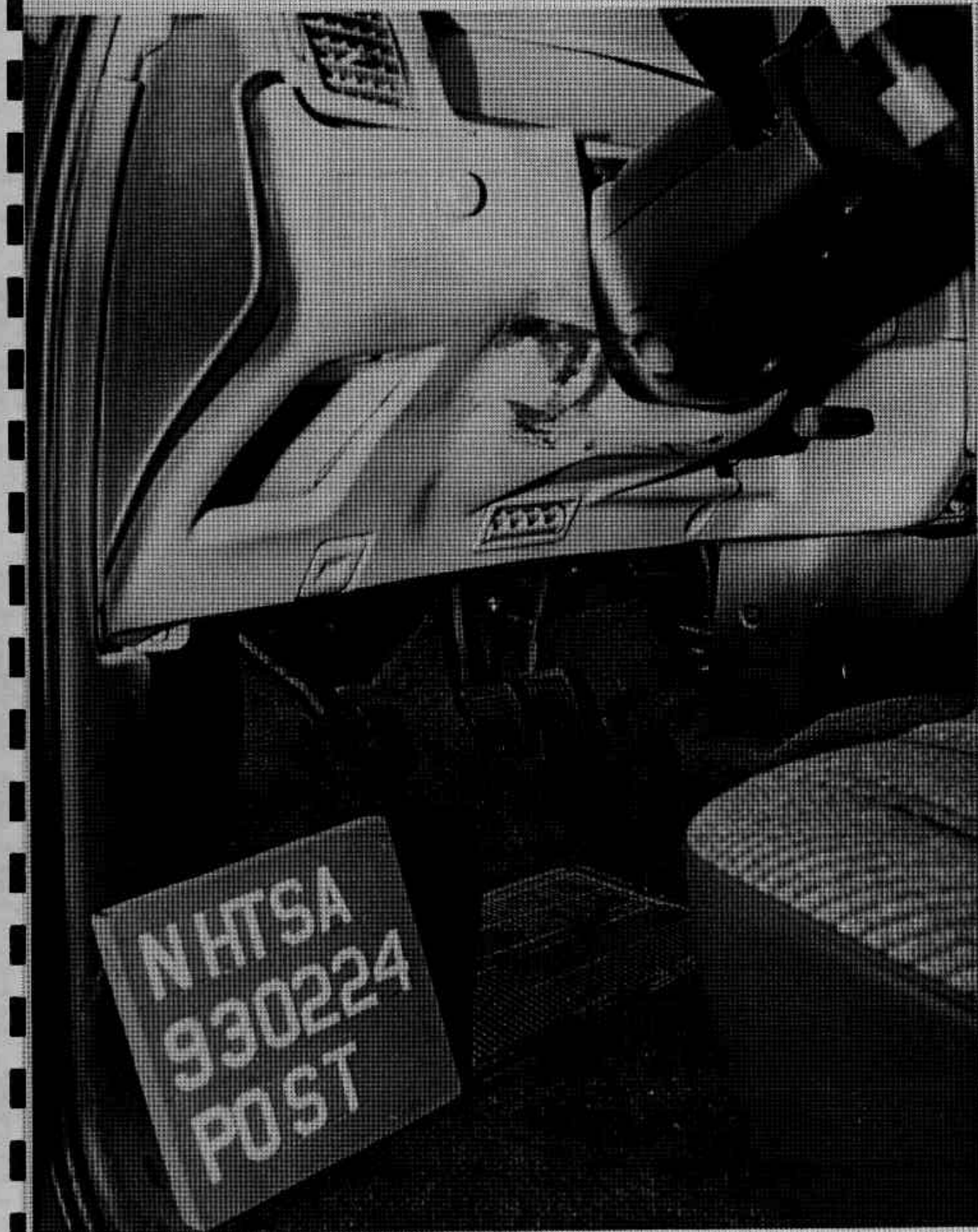


Figure A-43. POST-TEST DRIVER DUMMY KNEE CONTACT - VIEW 2

A-44

930224

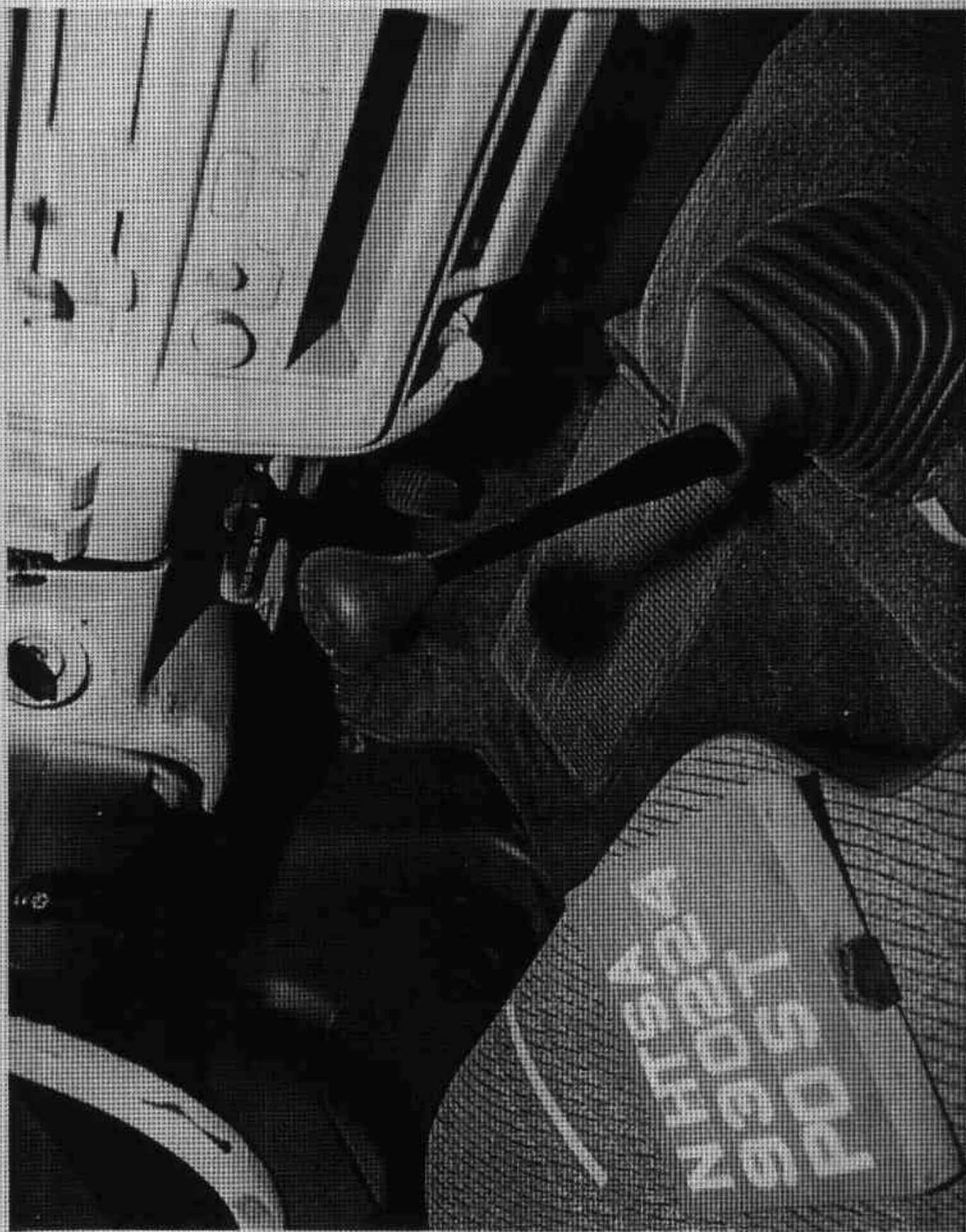


Figure A-44. POST-TEST DRIVER DUMMY KNEE CONTACT - VIEW 3

A-45

930224

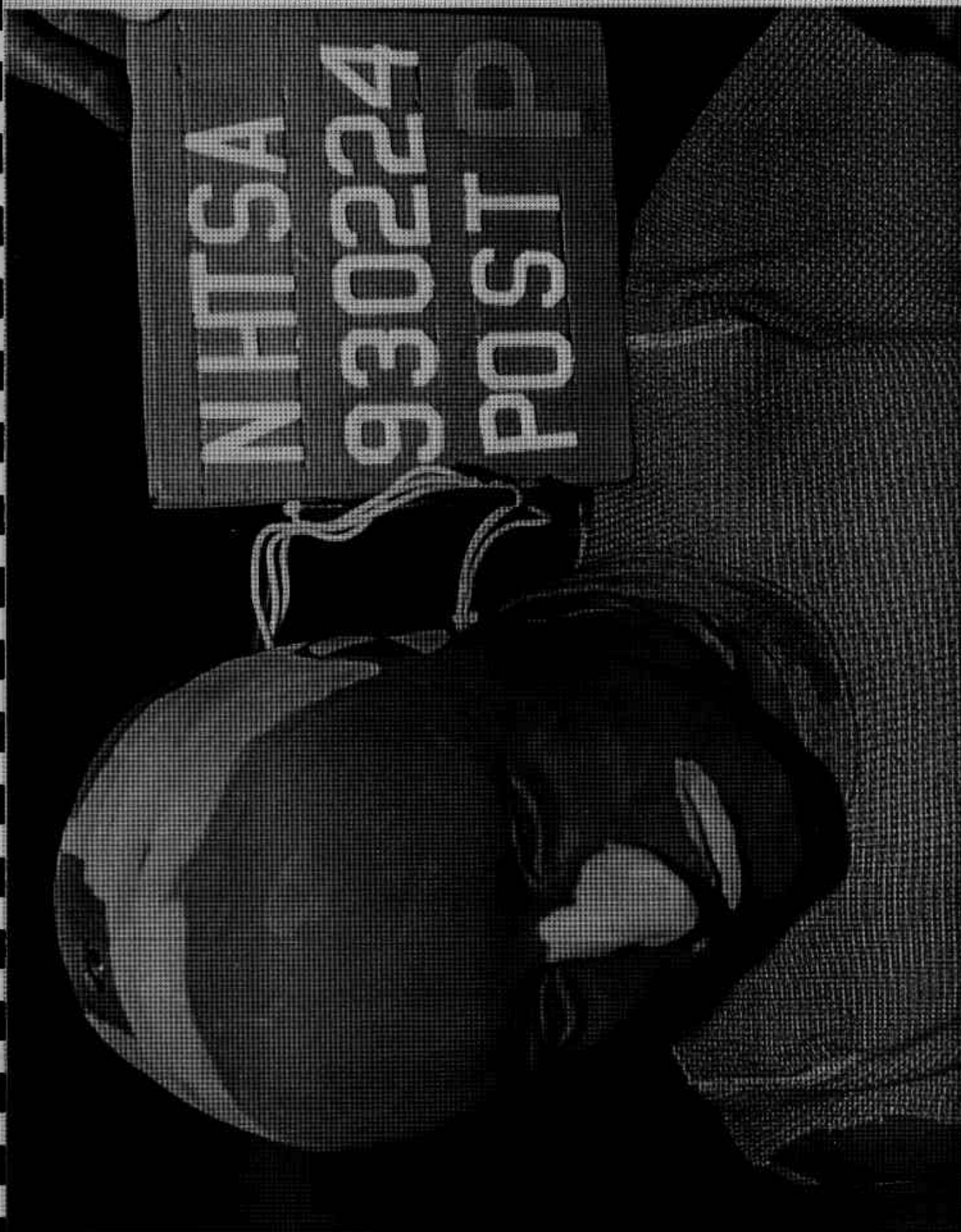


Figure A-45. POST-TEST PASSENGER DUMMY HEAD CONTACT VIEW

A-46

930224

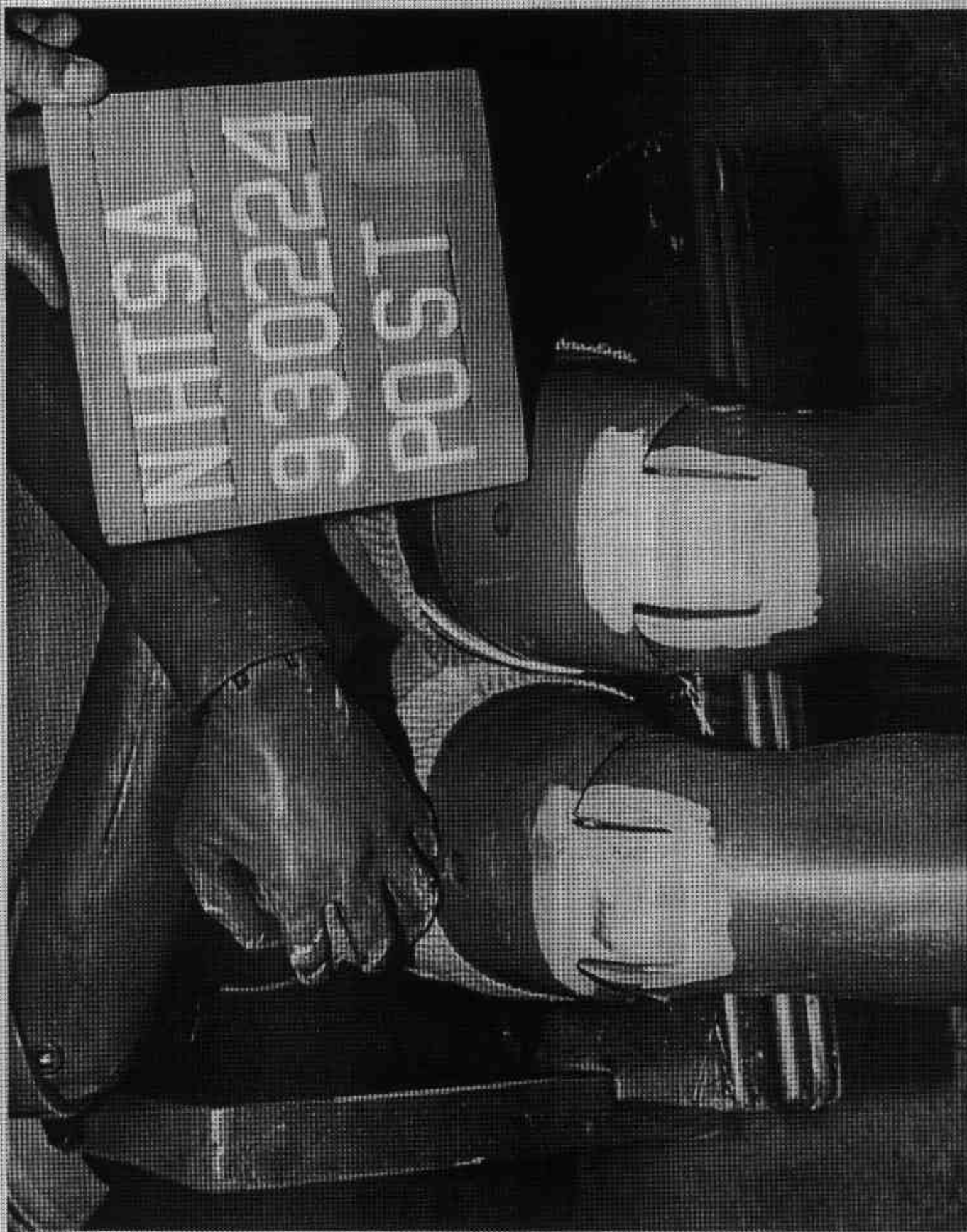


Figure A-46. POST-TEST PASSENGER DUMMY KNEE CONTACT - VIEW 1

A-47

930224

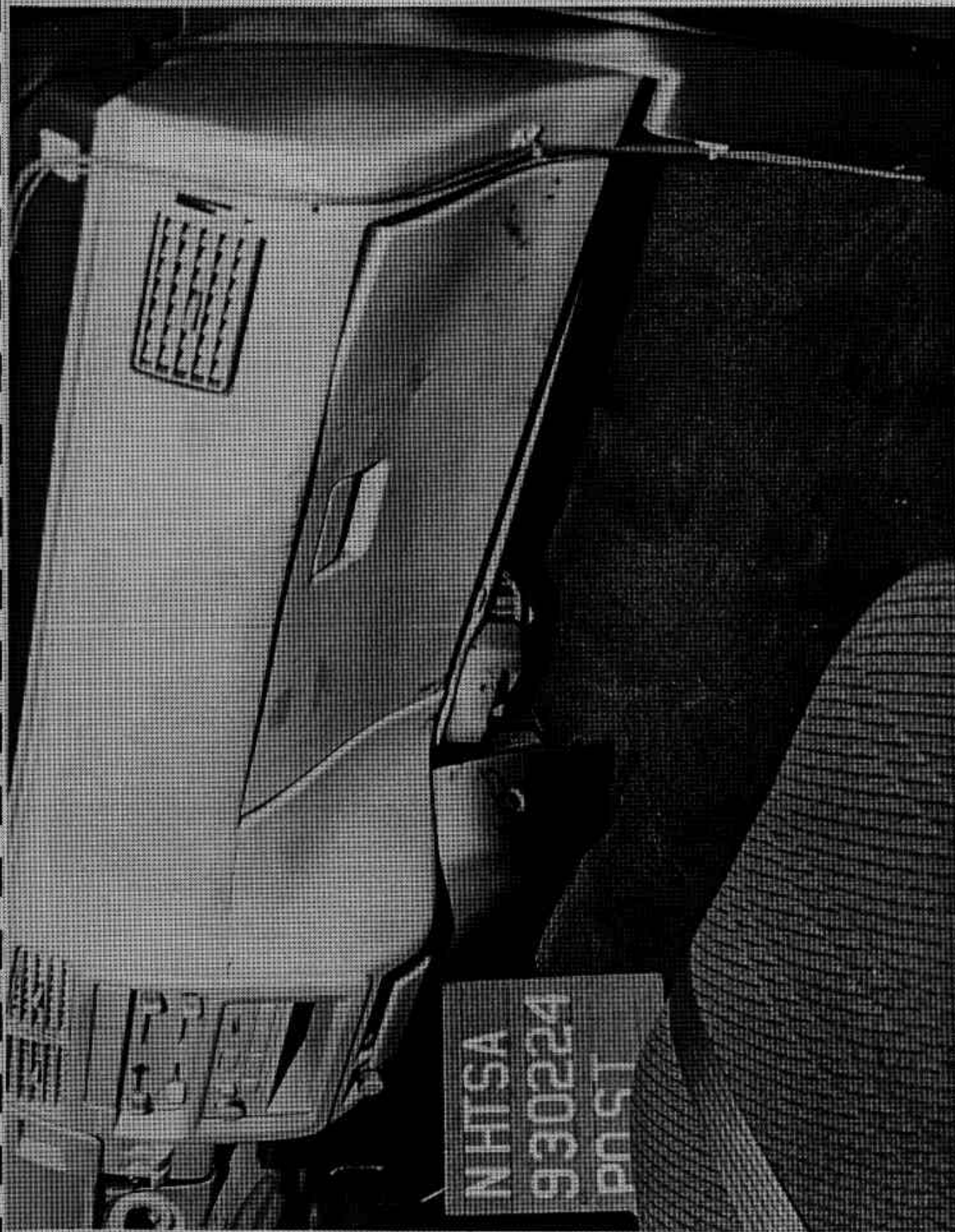


Figure A-47. POST-TEST PASSENGER DUMMY KNEE CONTACT - VIEW 2

A-48

930224

* MED BY TOYOTA MOTOR CORPORATION DATE 11/92
 GVWR (LBS) 5000
 QAWR (LBS) FRT 2550 WITH P215/75R15 TIRES.
 15X6JJ RIMS AT 26PSI COLD
 RR 3090 WITH P215/75R15 TIRES.
 15X6JJ RIMS AT 35PSI COLD
 THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL
 MOTOR VEHICLE SAFETY STANDARDS IN EFFECT ON THE
 DATE OF MANUFACTURE SHOWN ABOVE
 JT4VD10A6P0005145 TRUCK VK10L-TRMREA
 C/TR 3H7/FA13 A/TM A01A/R150 NO 046 MADE IN JAPAN

Fig. A-48. PRE-TEST VEHICLE CERT. & RECOMMENDED TIRE PRES. LABEL

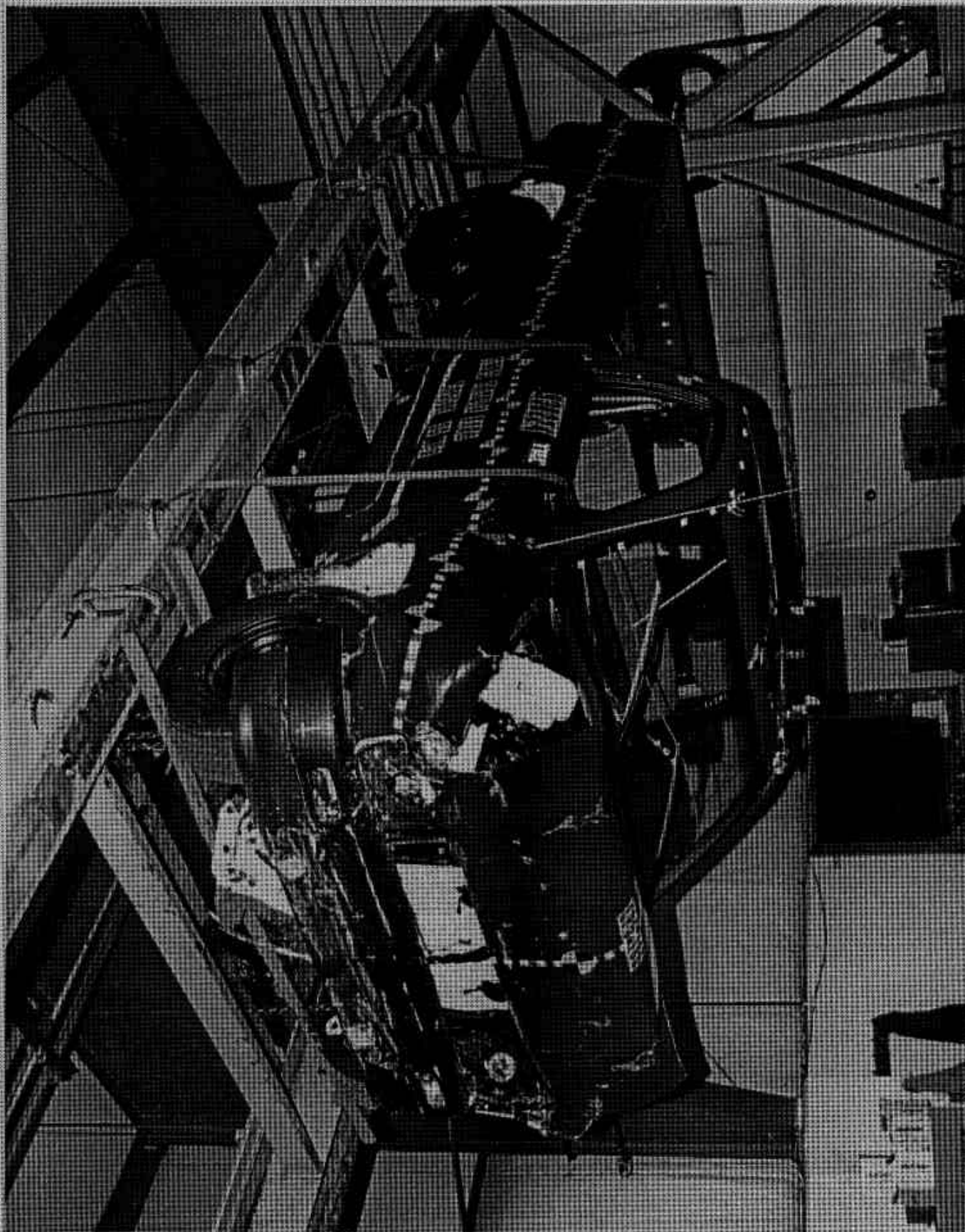


Figure A-49. POST-TEST VEHICLE ON STATIC ROLLOVER MACHINE VIEW

A-50

930224

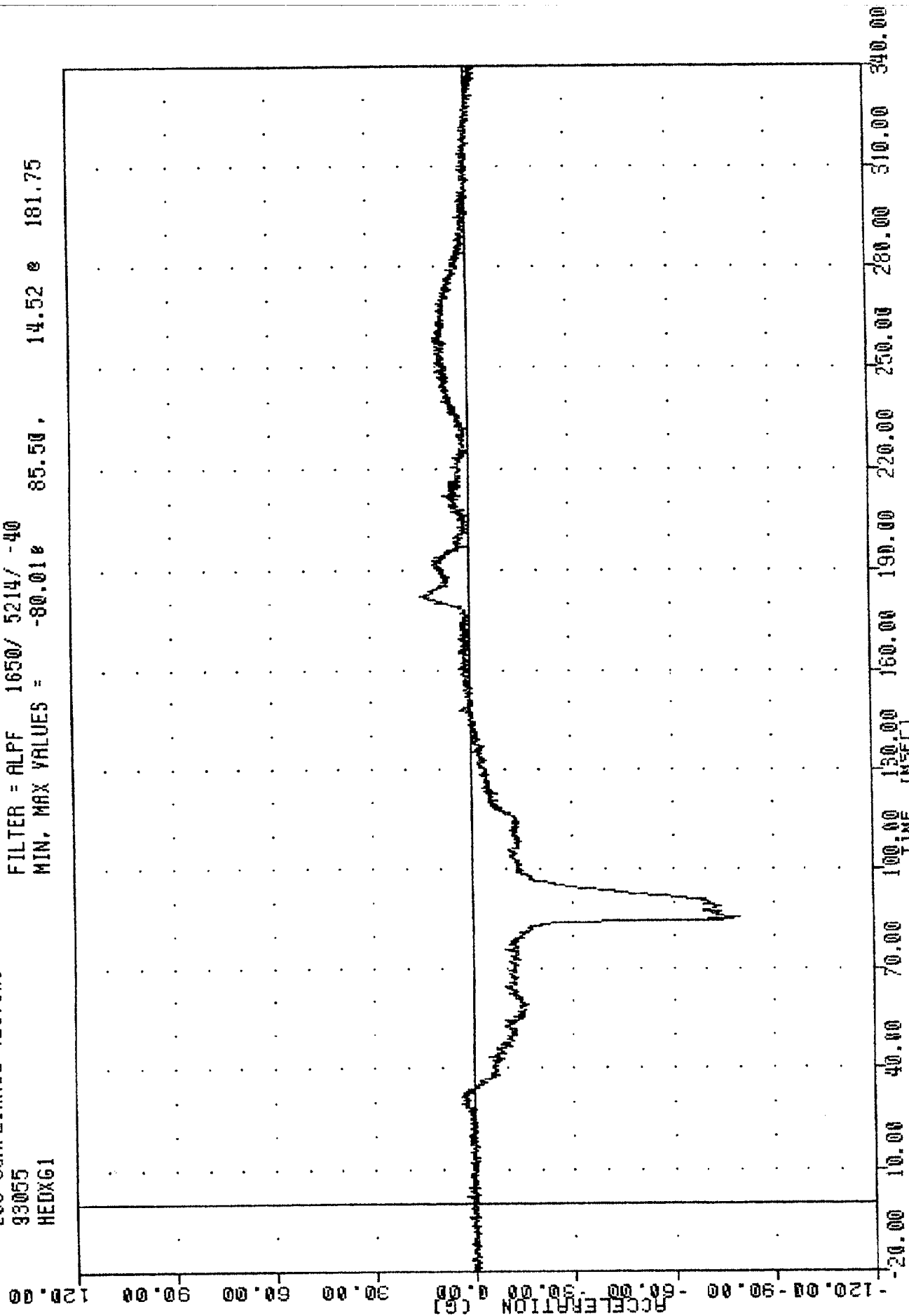
Intentionally Left Blank

APPENDIX B

DATA PLOTS

TRC , 930224
 200 COMPLIANCE TESTING
 93055
 HEDXG1

FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -80.01e 85.50, 14.52 e 181.75



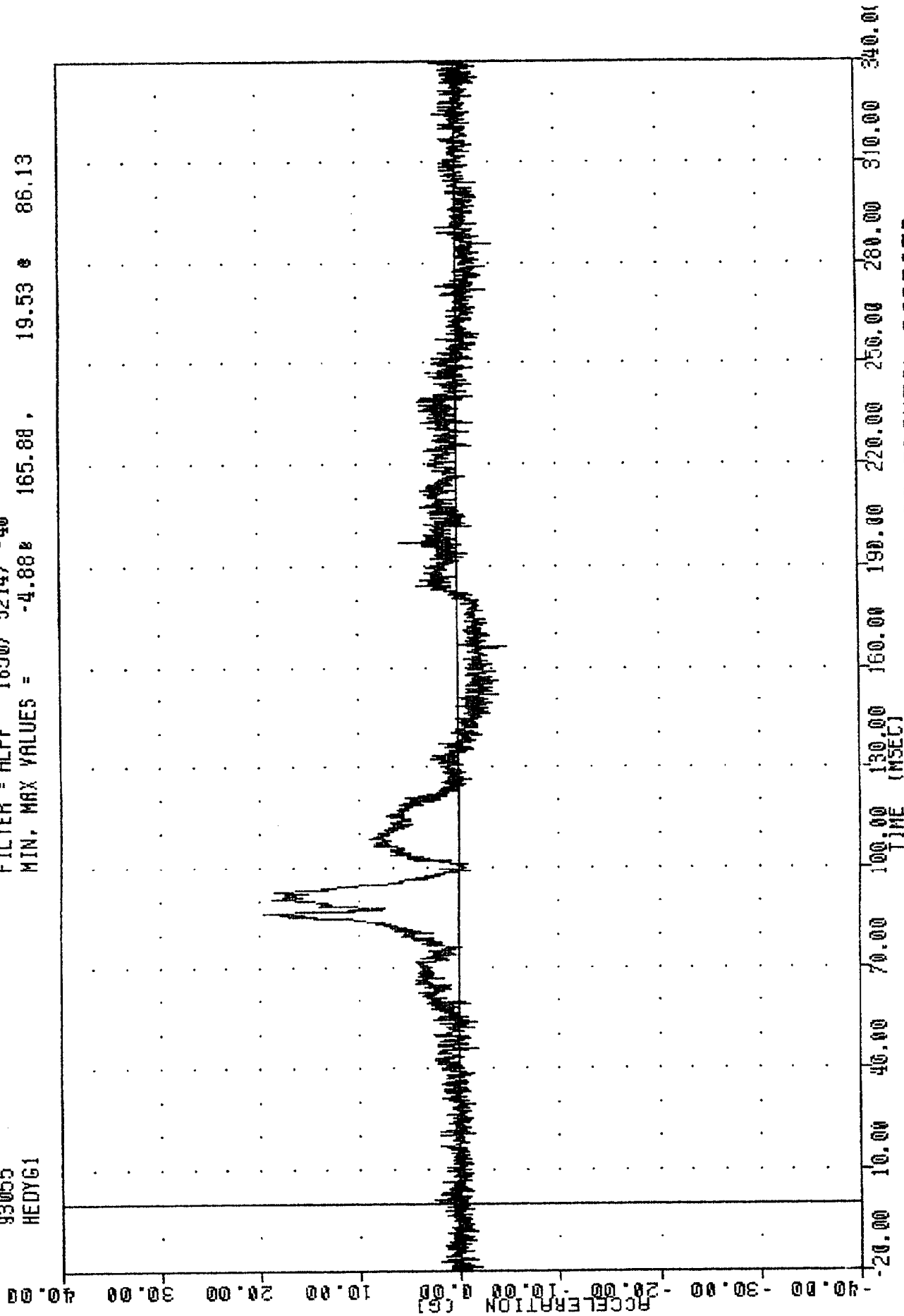
1993 TOYOTA T100 PICKUP INTO FLAT FRONTAL BARRIER

DRIVER HEAD X-Axis Acceleration

TRC
208 COMPLIANCE TESTING
93055
HEDYG1

, 930224

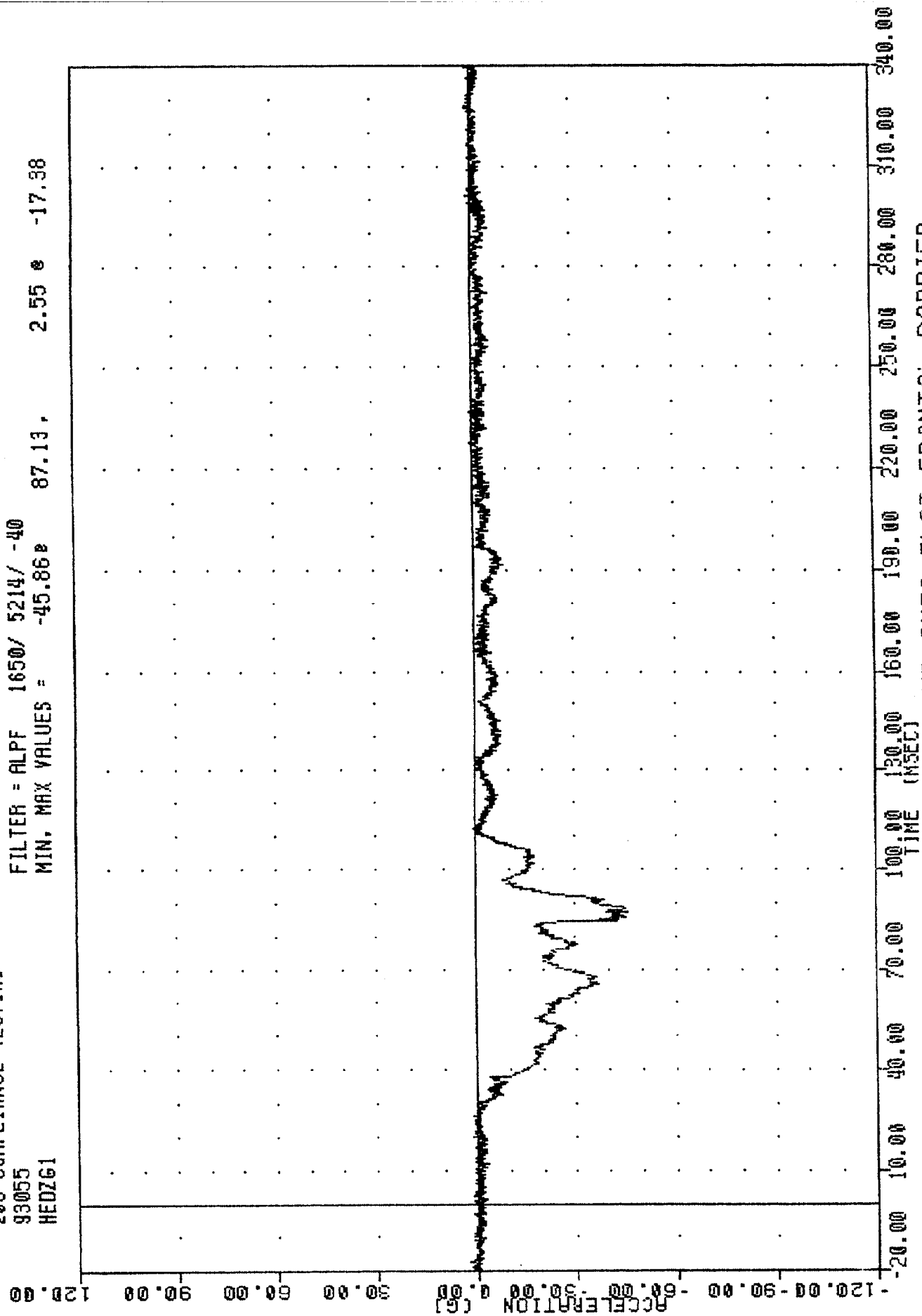
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -4.88% 165.88, 19.53 % 86.13



1993 TOYOTA T100 PICKUP INTO FLAT FRONTAL BARRIER
DRIVER HEAD Y-AXIS ACCELERATION

TRC , 930224
200 COMPLIANCE TESTING
93055
HEDZ61

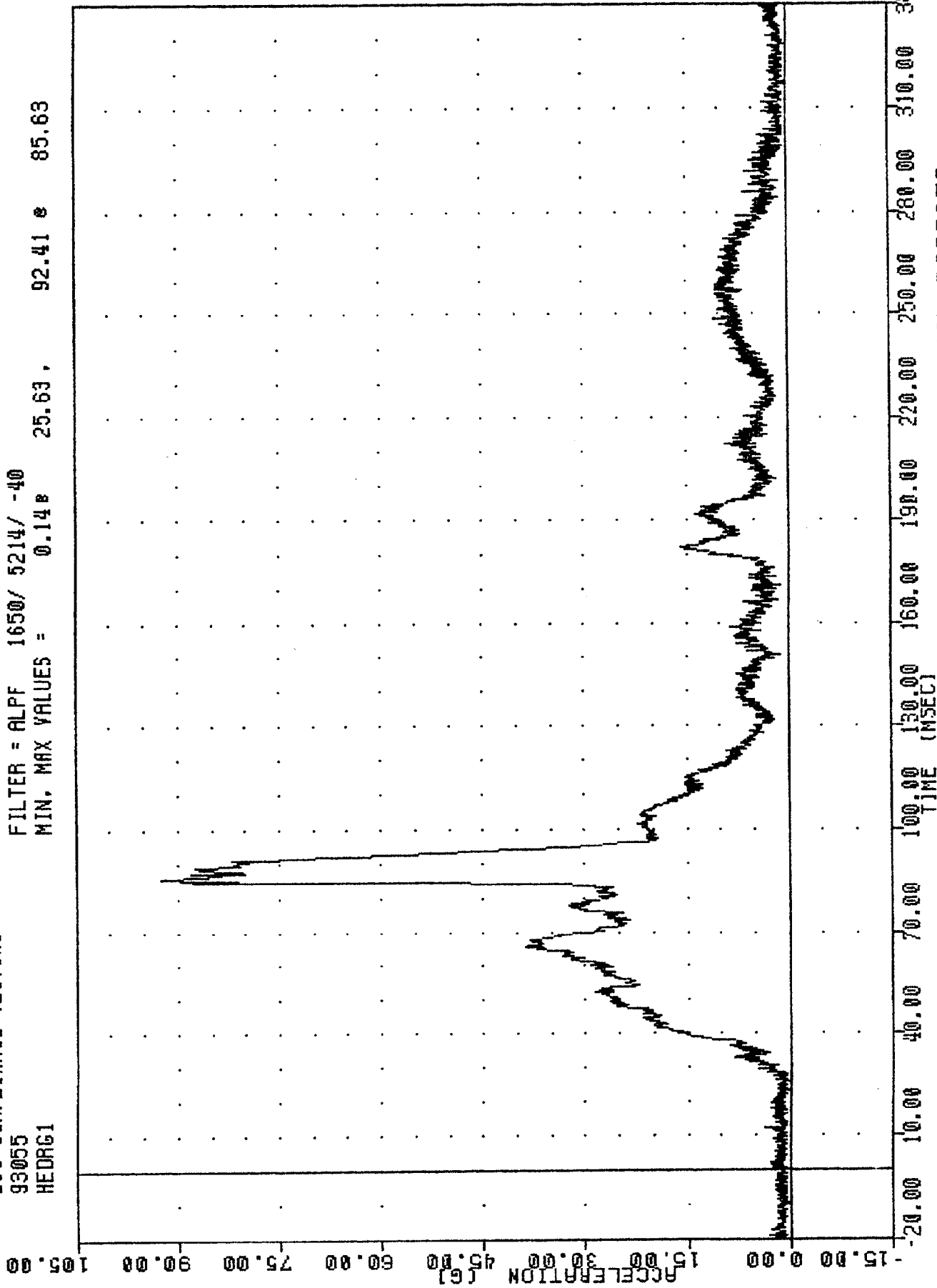
FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -45.86e 87.13, 2.55 e -17.38



1993 TOYOTA T100 PICKUP INTO FLAT FRONTAL BARRIER
DRIVER HEAD 3-Axis Acceleration

TRC . 930224
208 COMPLIANCE TESTING
93055
HEDRG1

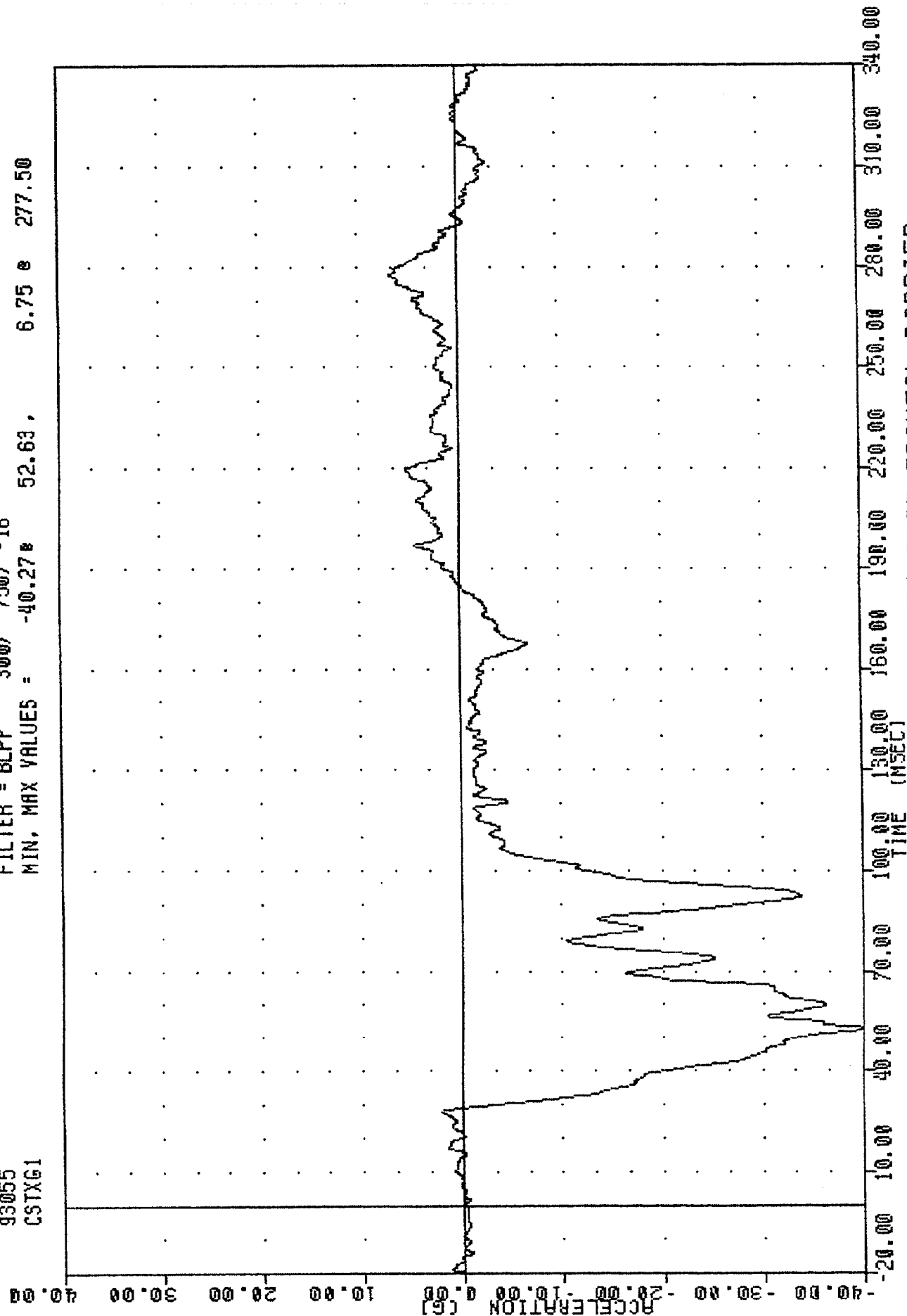
FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = 0.14 25.63, 92.41 85.63



1993 TOYOTA T100 PICKUP INTO FLAT FRONTAL BARRIER
DRIVER HEAD RESULTANT ACCELERATION

TRC , 930224
 208 COMPLIANCE TESTING
 93055
 CSTXG1

FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = -40.27 52.63, 6.75 277.50

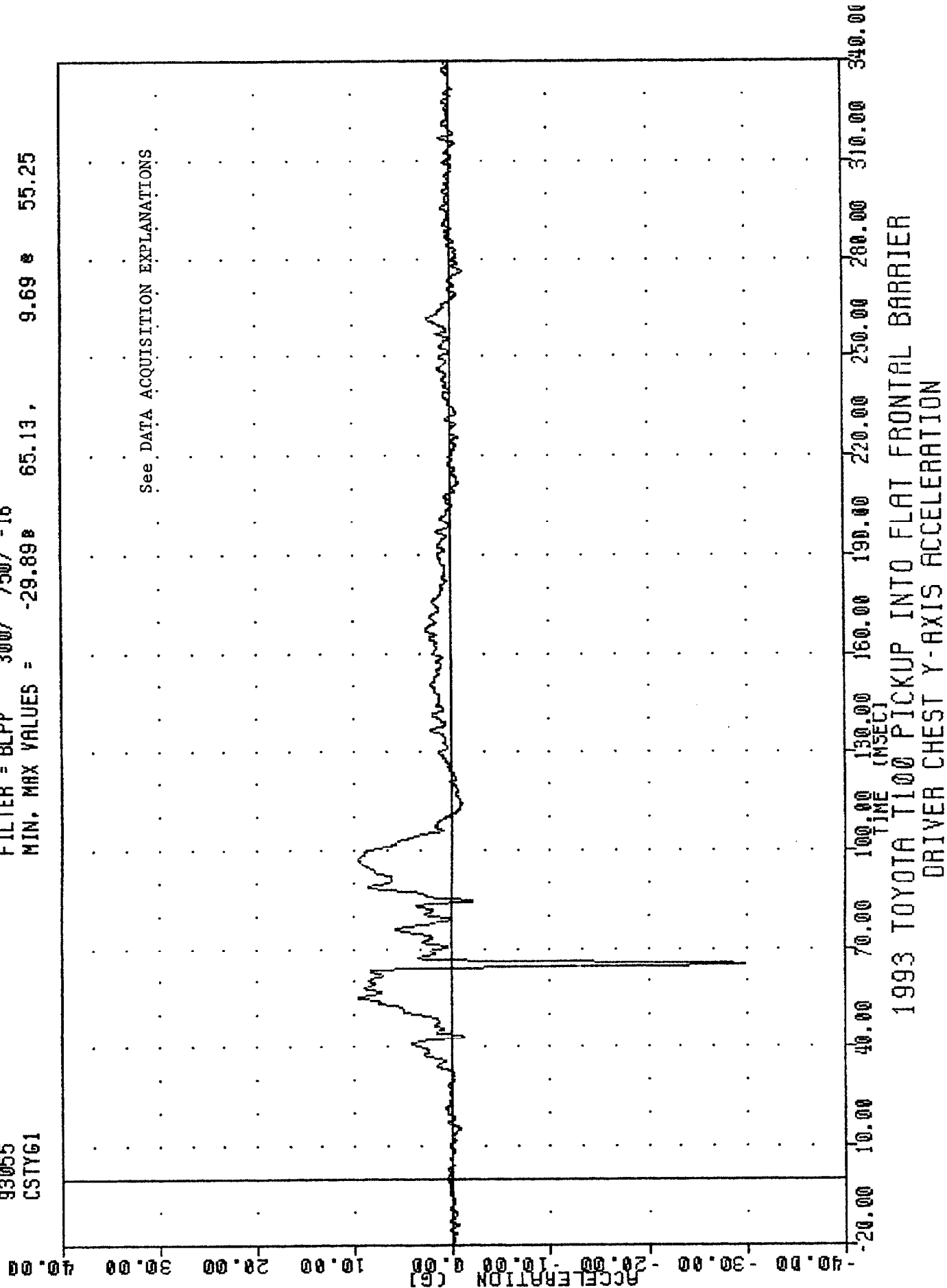


1993 TOYOTA T100 PICKUP INTO FLAT FRONTAL BARRIER

DRAWER CHEST X-RAYS ACCELERATION

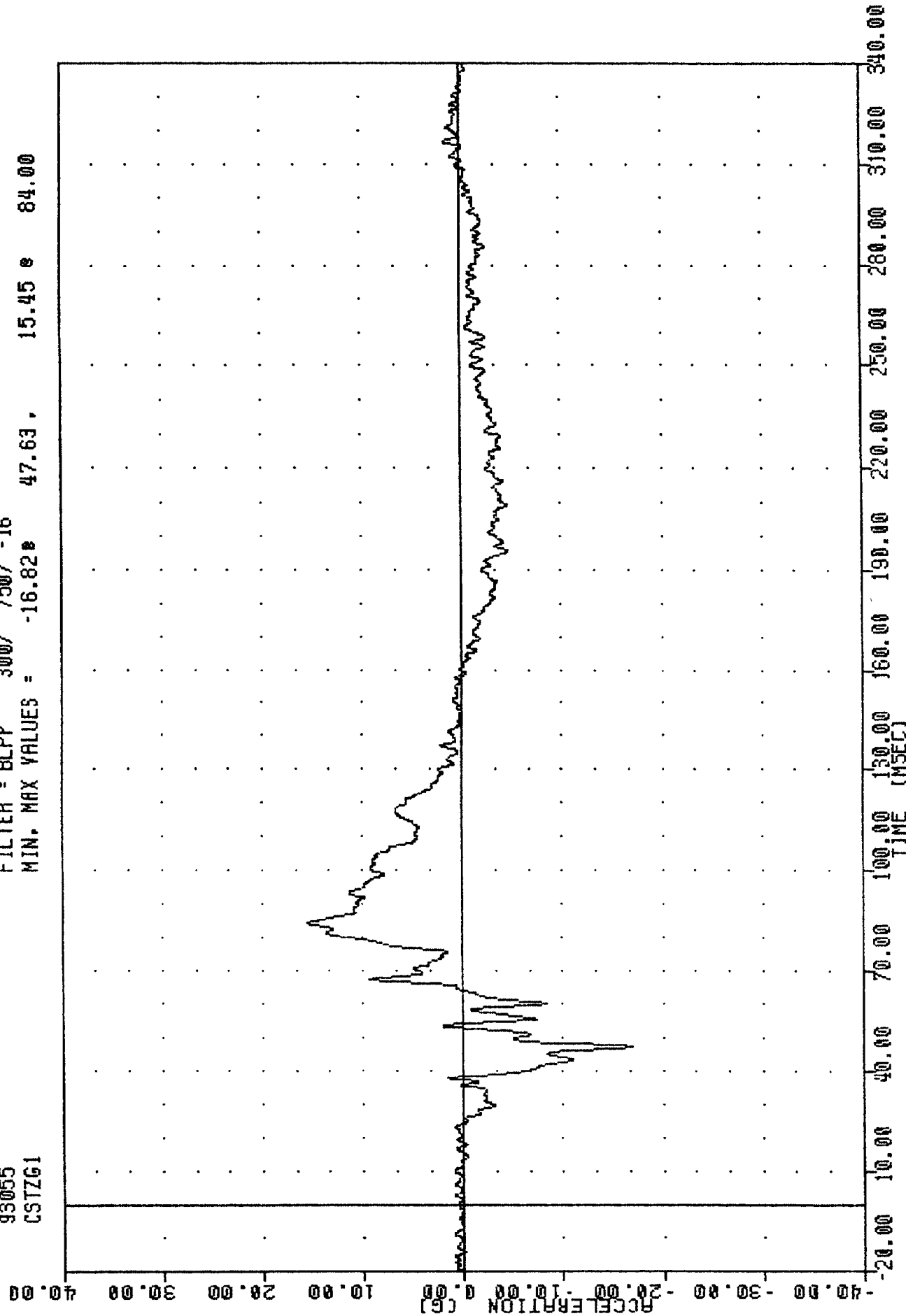
TRC
208 COMPLIANCE TESTING
93055
CSTY61

FILTER = BLPP 300/ 750/ -16
MIN. MAX VALUES = -29.89 65.13, 9.69 55.25



TRC , 930224
 208 COMPLIANCE TESTING
 93055
 CSTZG1

FILTER = BLPP 300/ 750/ -16
 MIN. MAX VALUES = -16.82 47.63, 15.45 84.00



TRC
208 COMPLIANCE TESTING
93055
CSTRG1

, 930224

FILTER = BLPP 300/ 750/ -16
MIN, MAX VALUES = 0.188 -20.00, 43.21 & 65.13

105.00

90.00

75.00

60.00

45.00

30.00

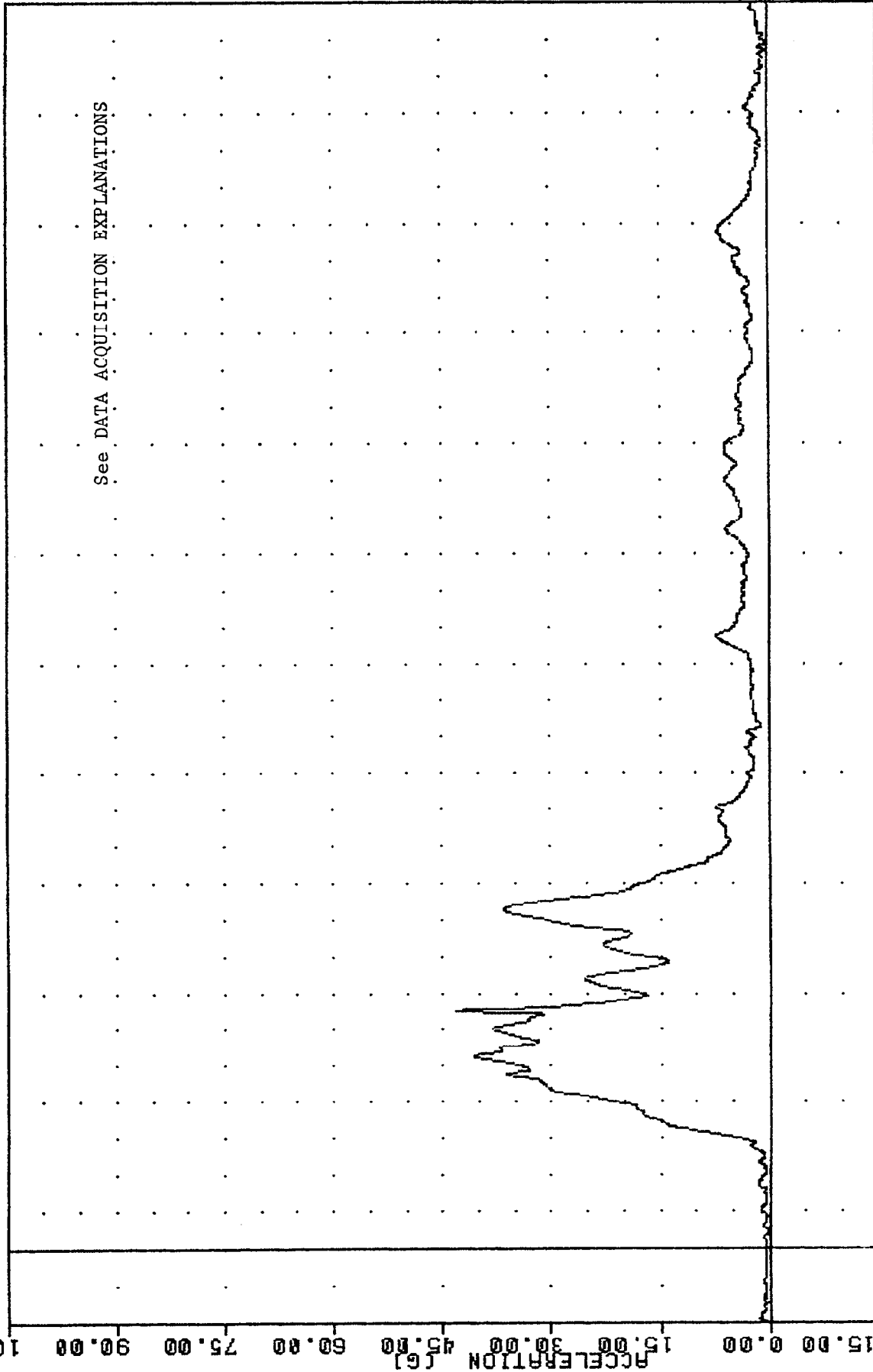
15.00

0.00

-15.00

B-9

930224

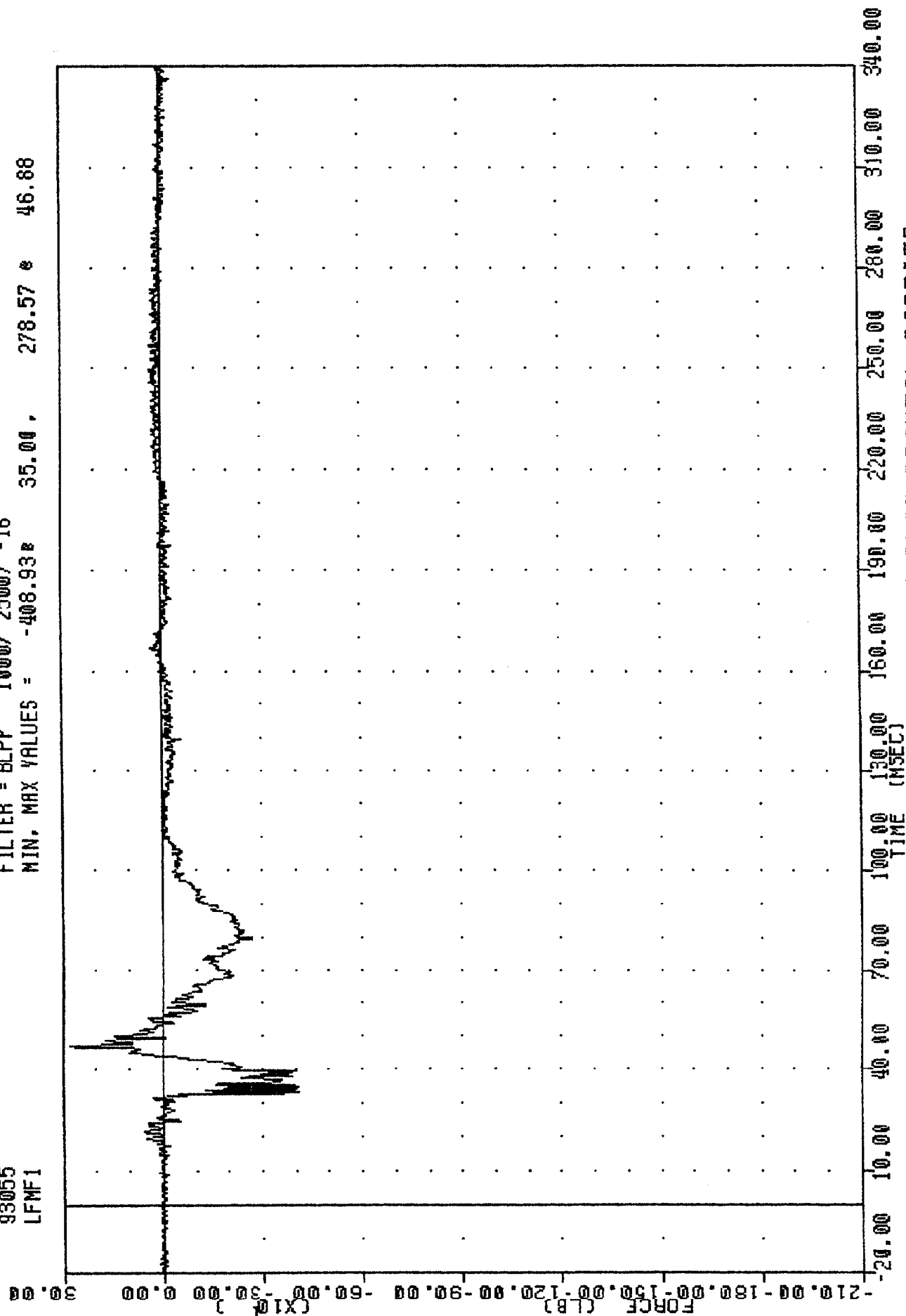


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
TIME (MSEC)

1993 TOYOTA T100 PICKUP INTO FLAT FRONTAL BARRIER
DRIVER CHEST RESULTANT ACCELERATION

TRC , 930224
 200 COMPLIANCE TESTING
 93055
 LFMF1

FILTER = BLPP 1000/ 2500/ -16
 MIN, MAX VALUES = -408.93 35.00, 278.57 46.88



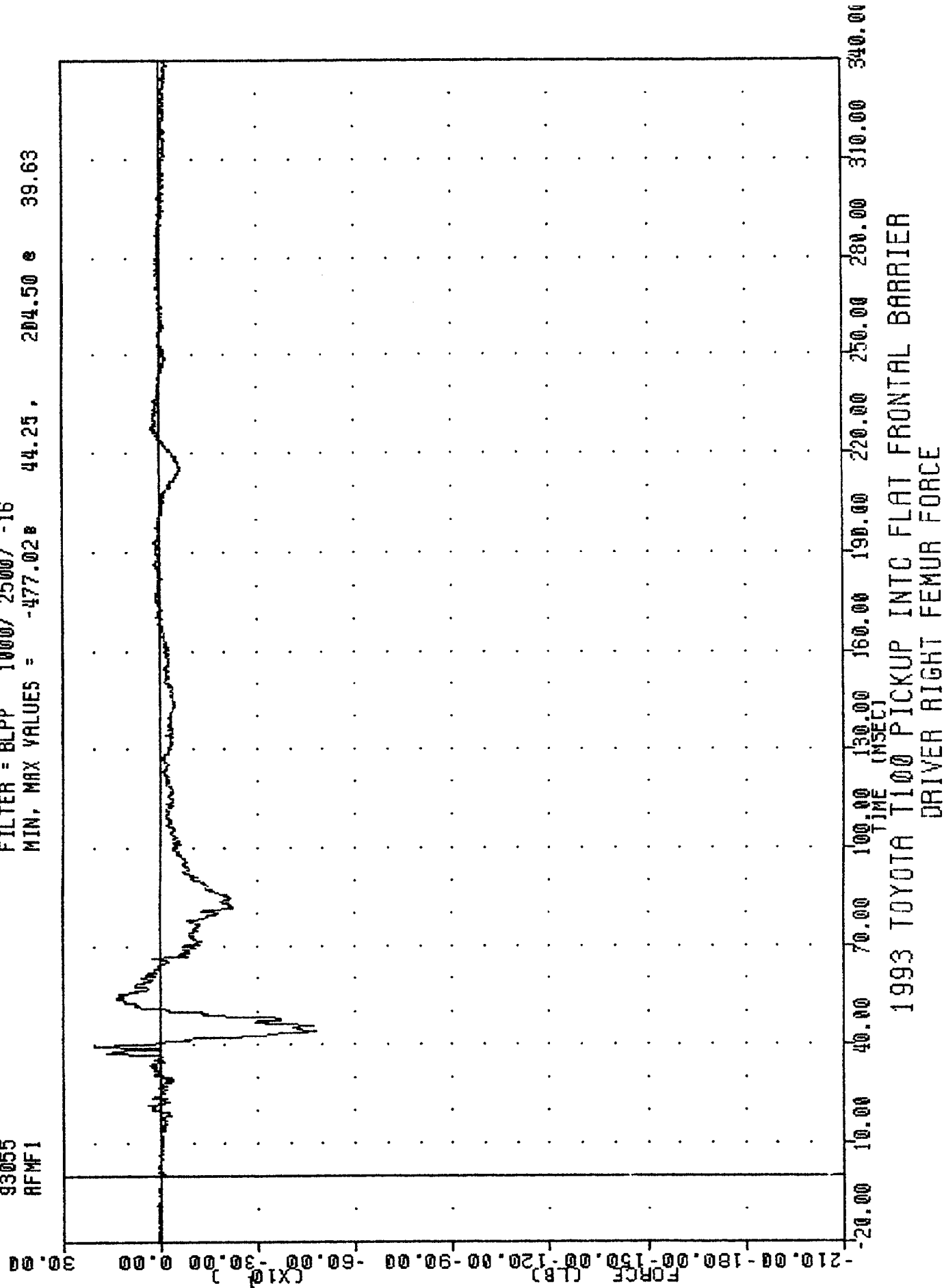
1993 TOYOTA T100 PICKUP INTO FLAT FRONTAL BARRIER

DRIVER LEFT SEAT FORCE

TRC
208 COMPLIANCE TESTING
93055
RFMF1

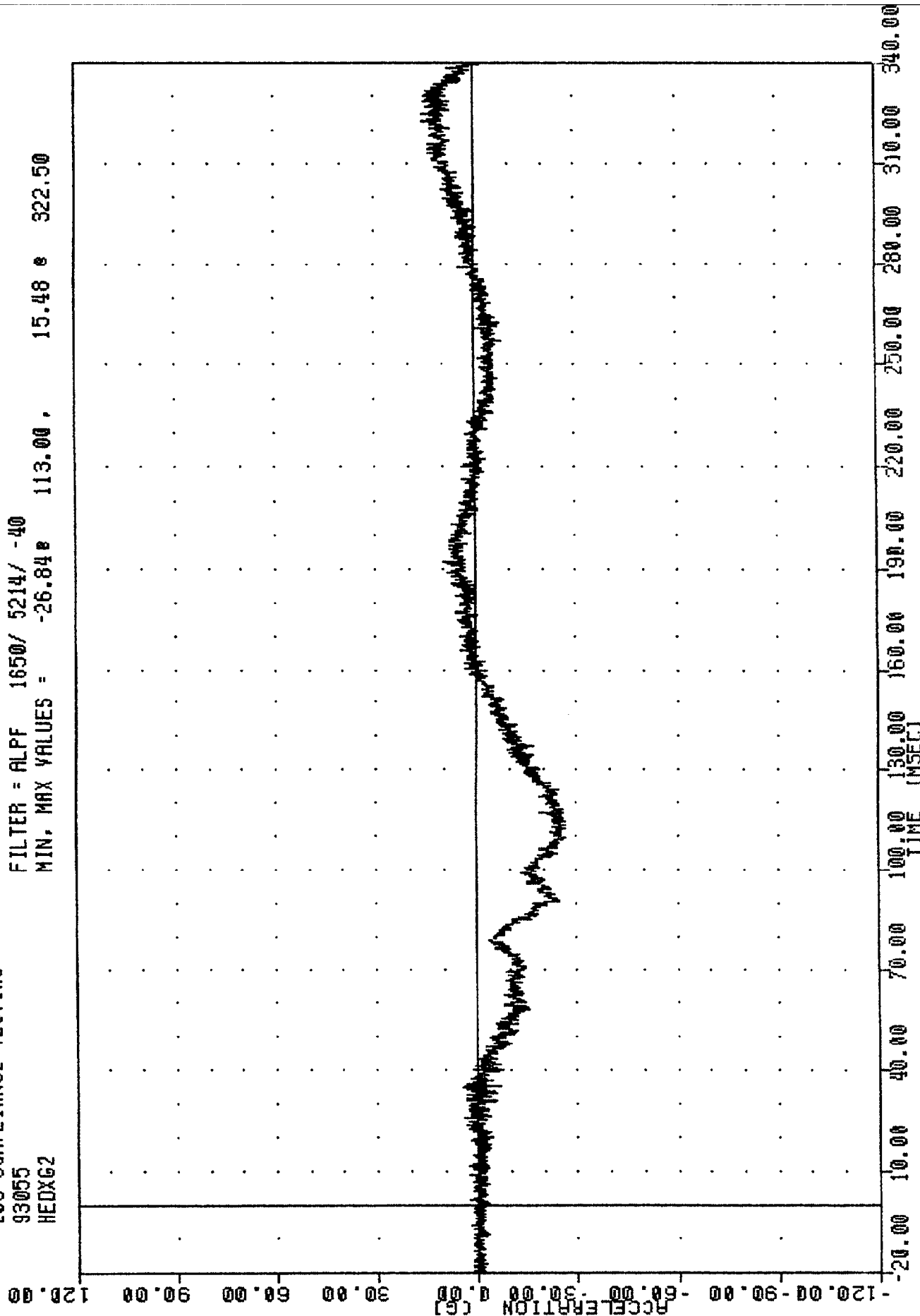
, 930224

FILTER = BLPP 1000/ 2500/ -16
MIN, MAX VALUES = -477.028 44.25, 204.50 e 39.63



TRC , 930224
 208 COMPLIANCE TESTING
 93055
 HEDXG2

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = -26.84 e 113.00 , 15.48 e 322.50

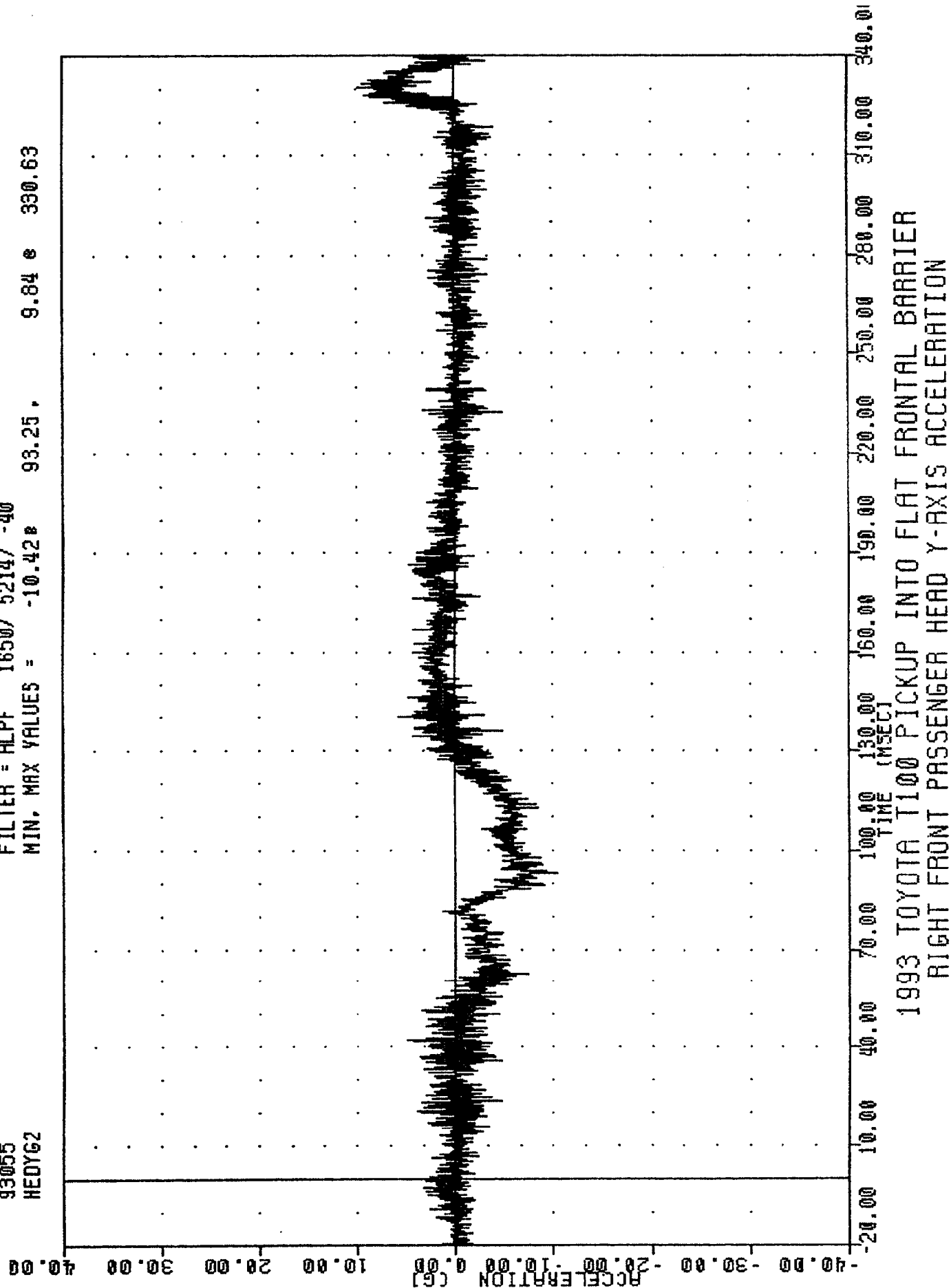


1993 TOYOTA T100 PICKUP INTO FLAT FRONTAL BARRIER

FRONT PASSENGER SIDE AIR BAG DEPLOYMENT

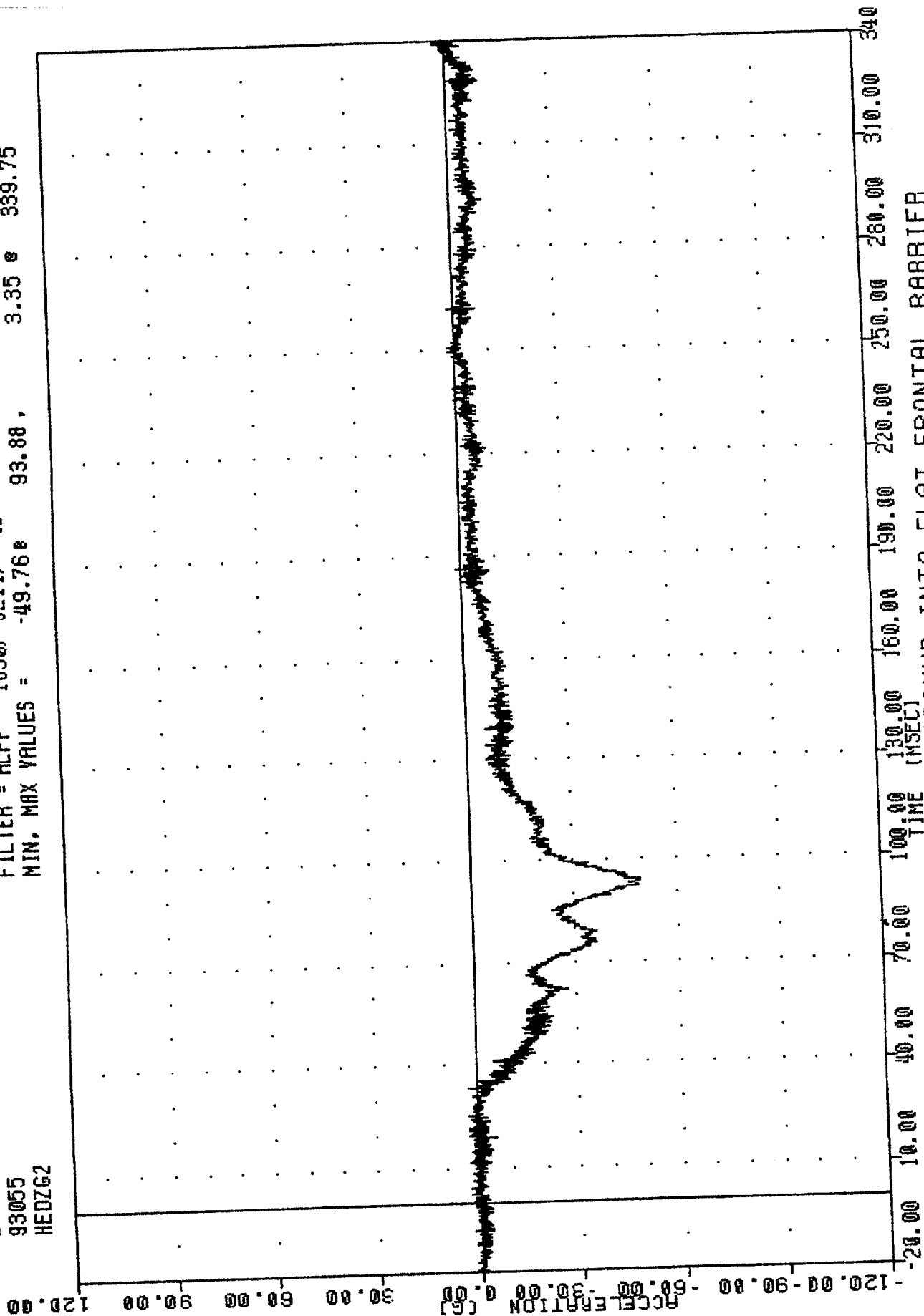
TRC , 930224
200 COMPLIANCE TESTING
93055
HEDYG2

FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -10.42 93.25 9.84 330.63



TRC , 930224
 208 COMPLIANCE TESTING
 93055
 HEDZG2

FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = -49.76 93.88 , 3.35 339.75



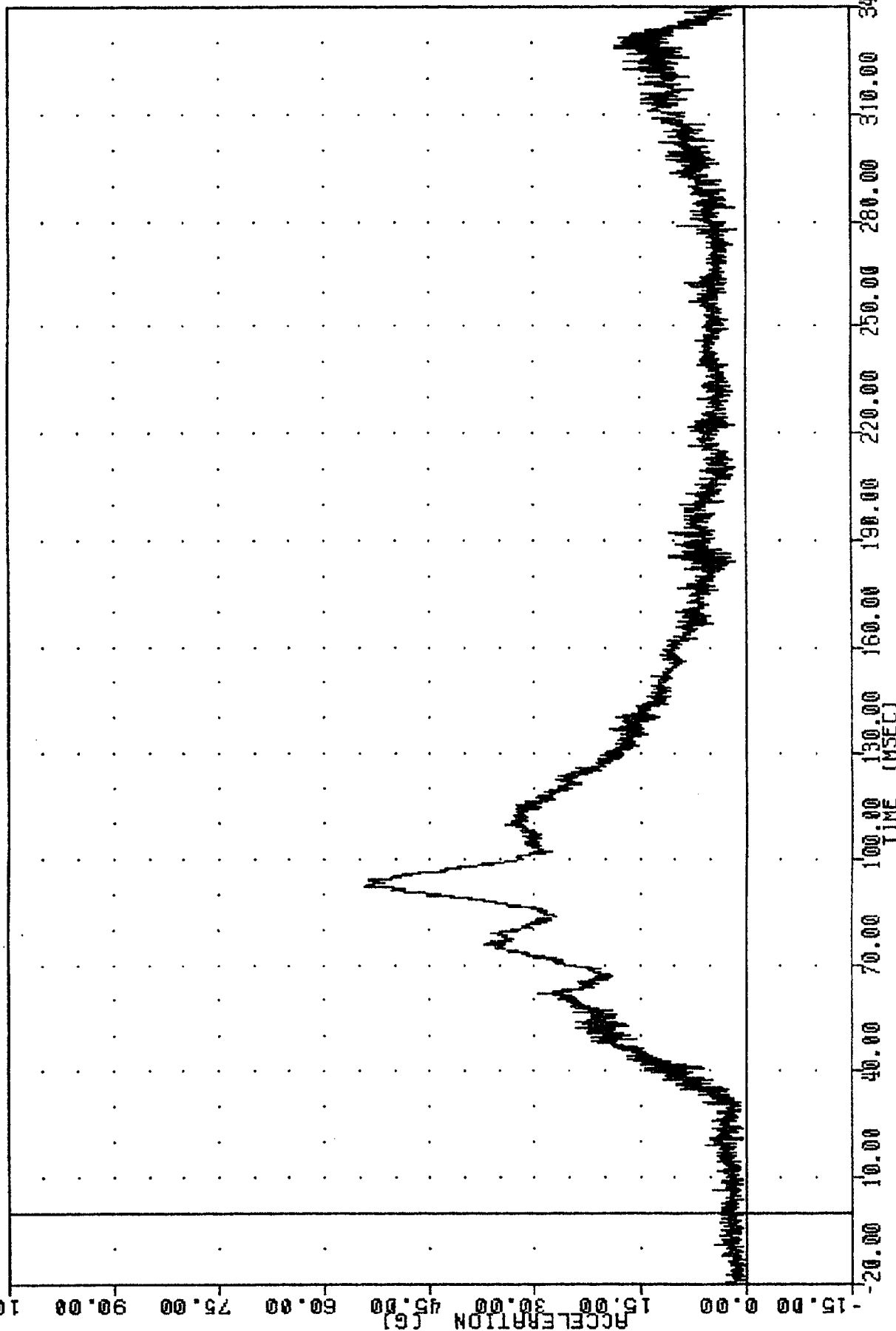
1993 TOYOTA T100 PICKUP INTO FLAT FRONTAL BARRIER
 OFFSET FRONT PASSENGER HEAD Z-Axis Acceleration

TRC
 208 COMPLIANCE TESTING
 93055
 HEDRG2

930224

FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = 0.328 -19.25, 54.19 e 92.25

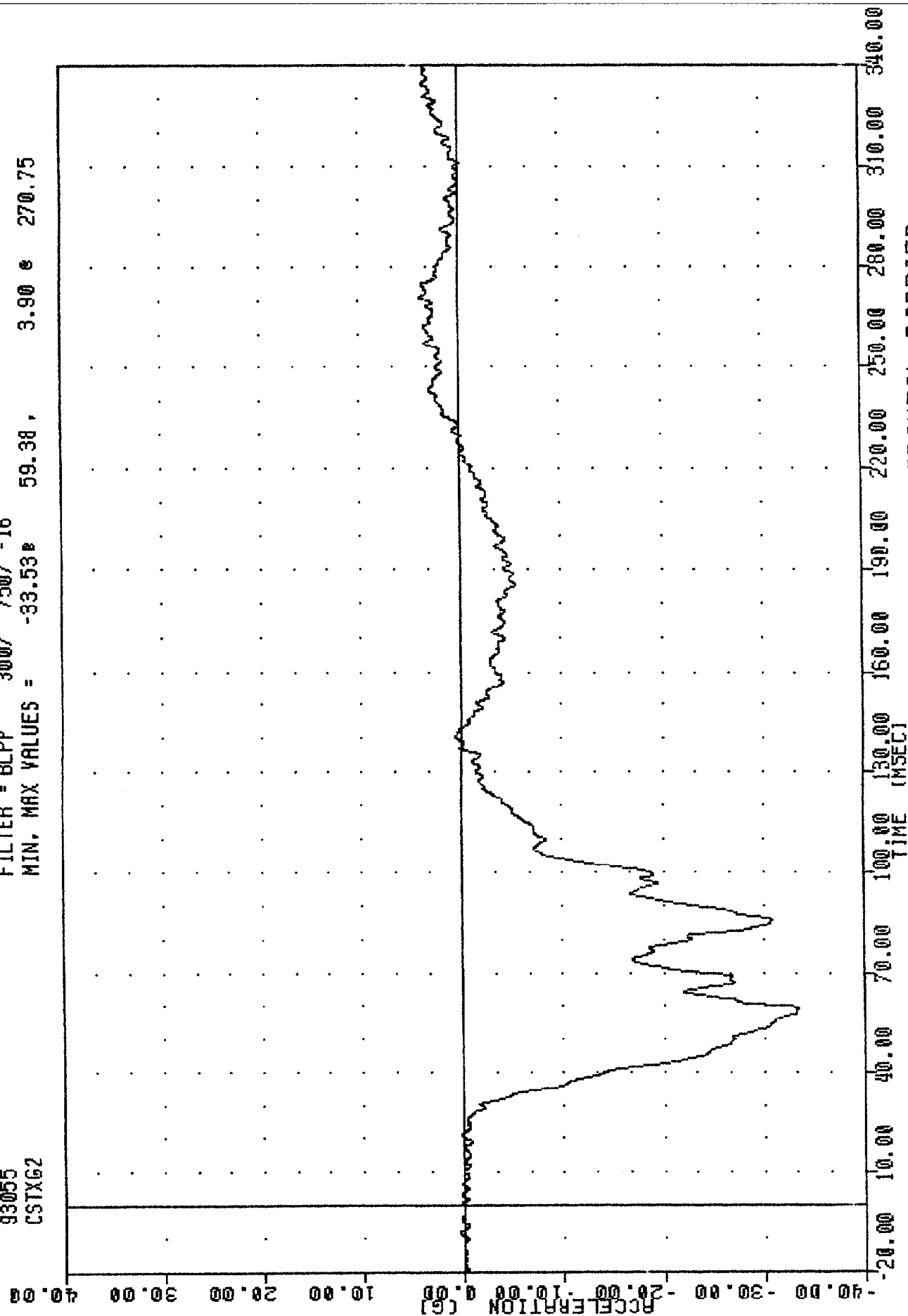
105.00



1993 TOYOTA T100 PICKUP INTO FLAT FRONTAL BARRIER
 RIGHT FRONT PASSENGER HEAD RESULTANT ACCELERATION

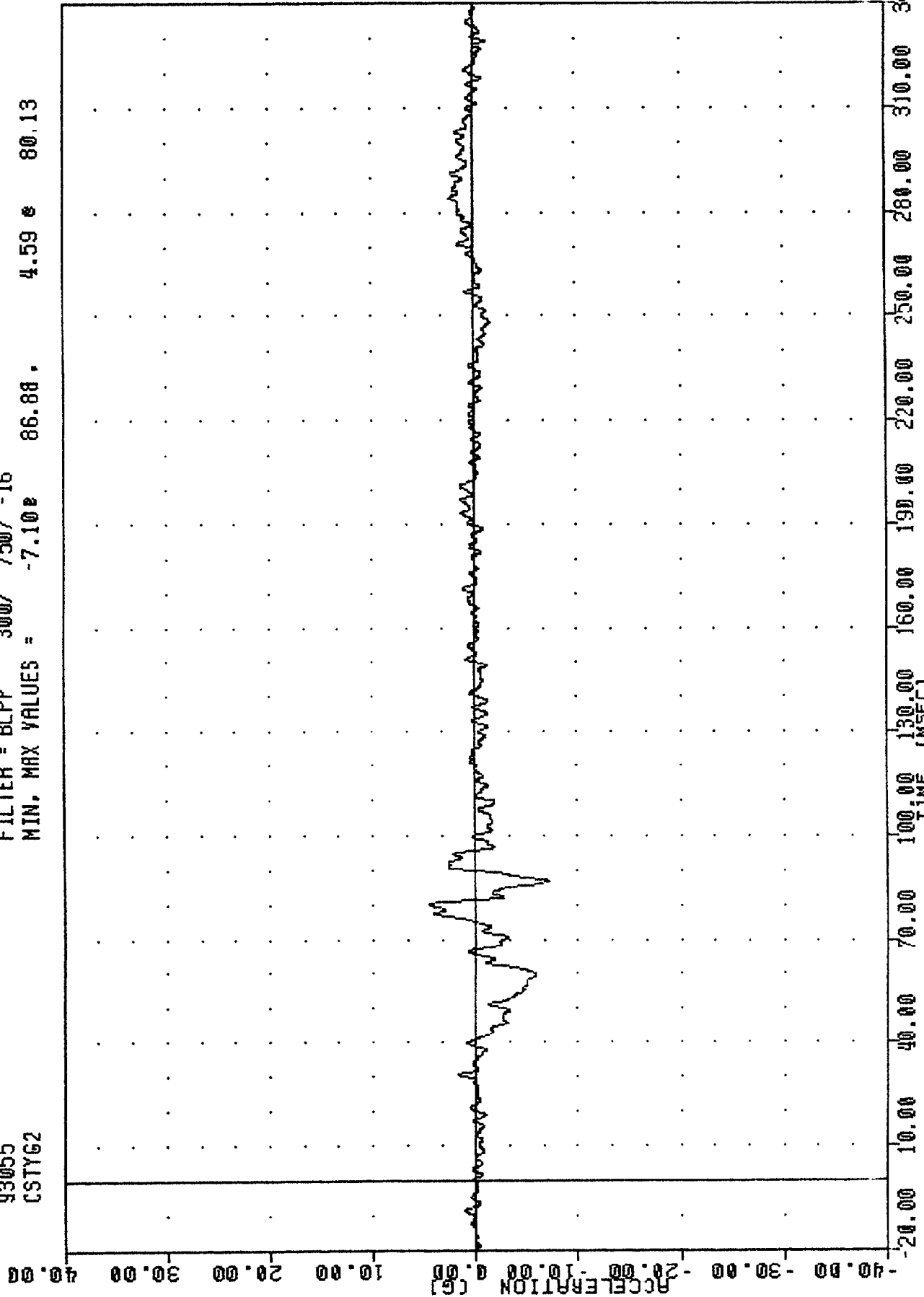
TRC 930224
 208 COMPLIANCE TESTING
 93055
 CSTX62

FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = -33.53 59.38 3.90 270.75



TRC
930224
208 COMPLIANCE TESTING
93055
CSTYG2

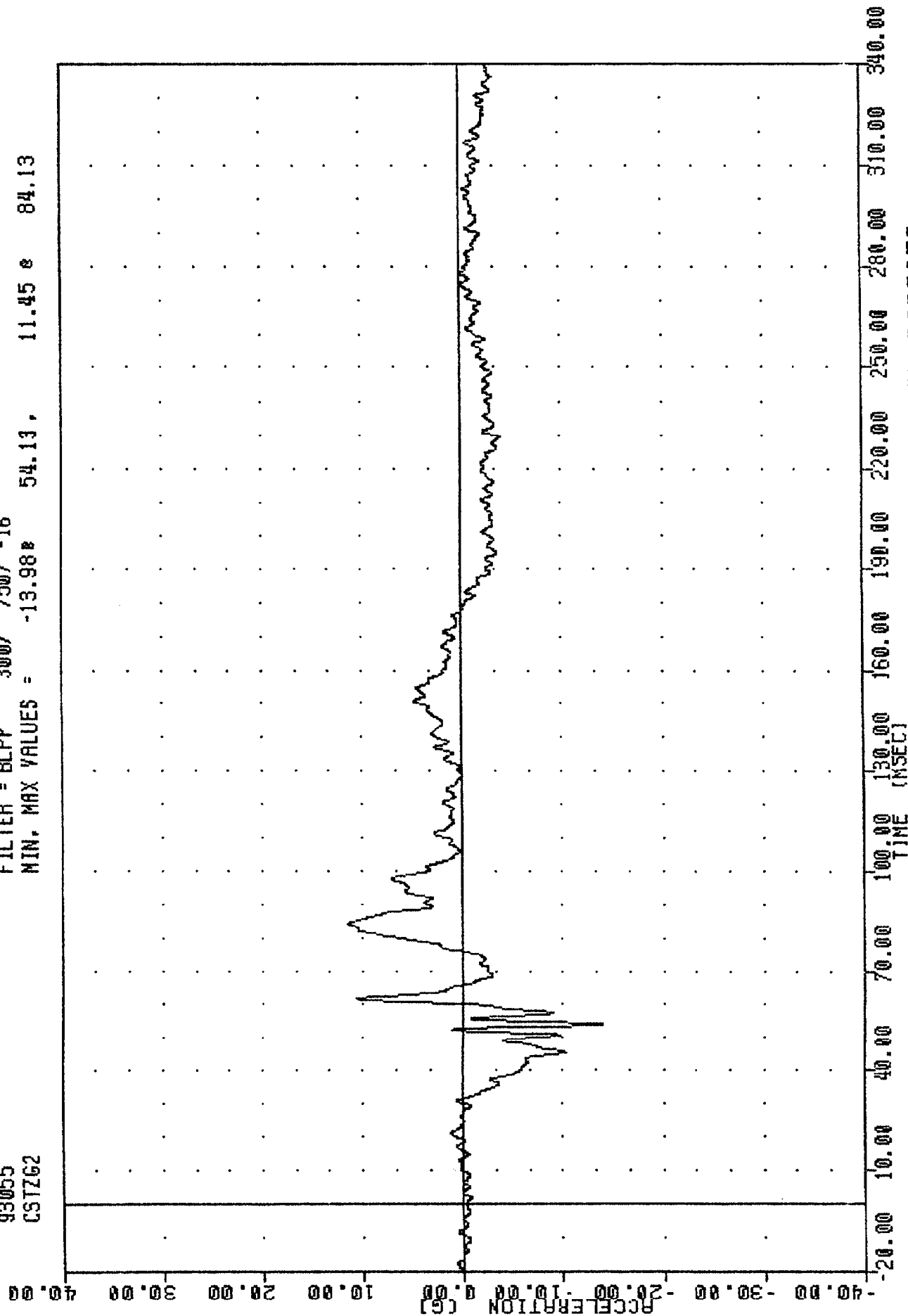
FILTER = BLPP 300/ 750/ -16
MIN. MAX VALUES = -7.10e 86.88. 4.59 e 80.13



1993 TOYOTA T100 PICKUP INTO FLAT FRONTAL BARRIER
RIGHT FRONT PASSENGER CHEST Y-AXIS ACCELERATION

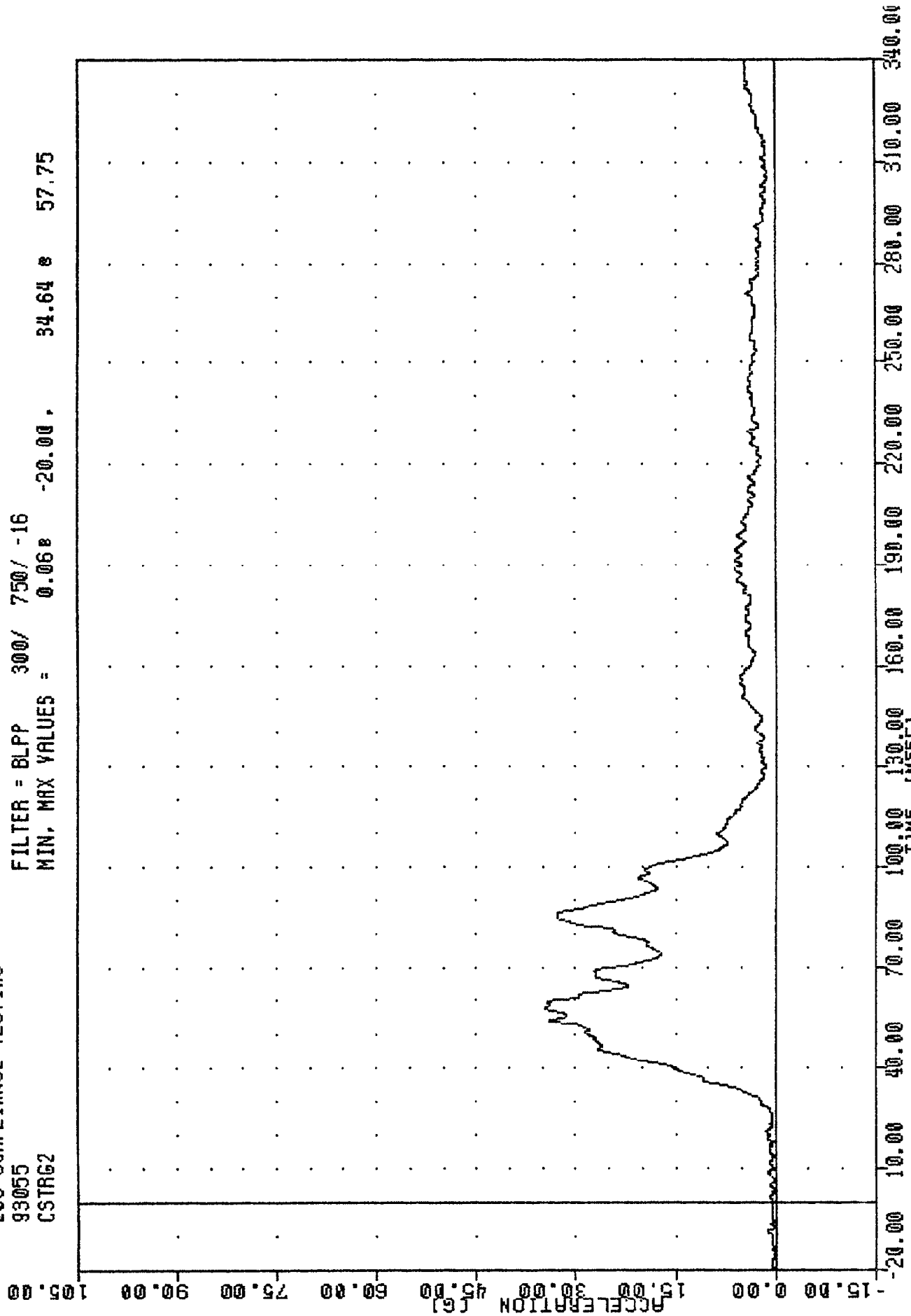
TRC , 930224
 208 COMPLIANCE TESTING
 93055
 CSTZG2

FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = -13.98 54.13, 11.45 84.13



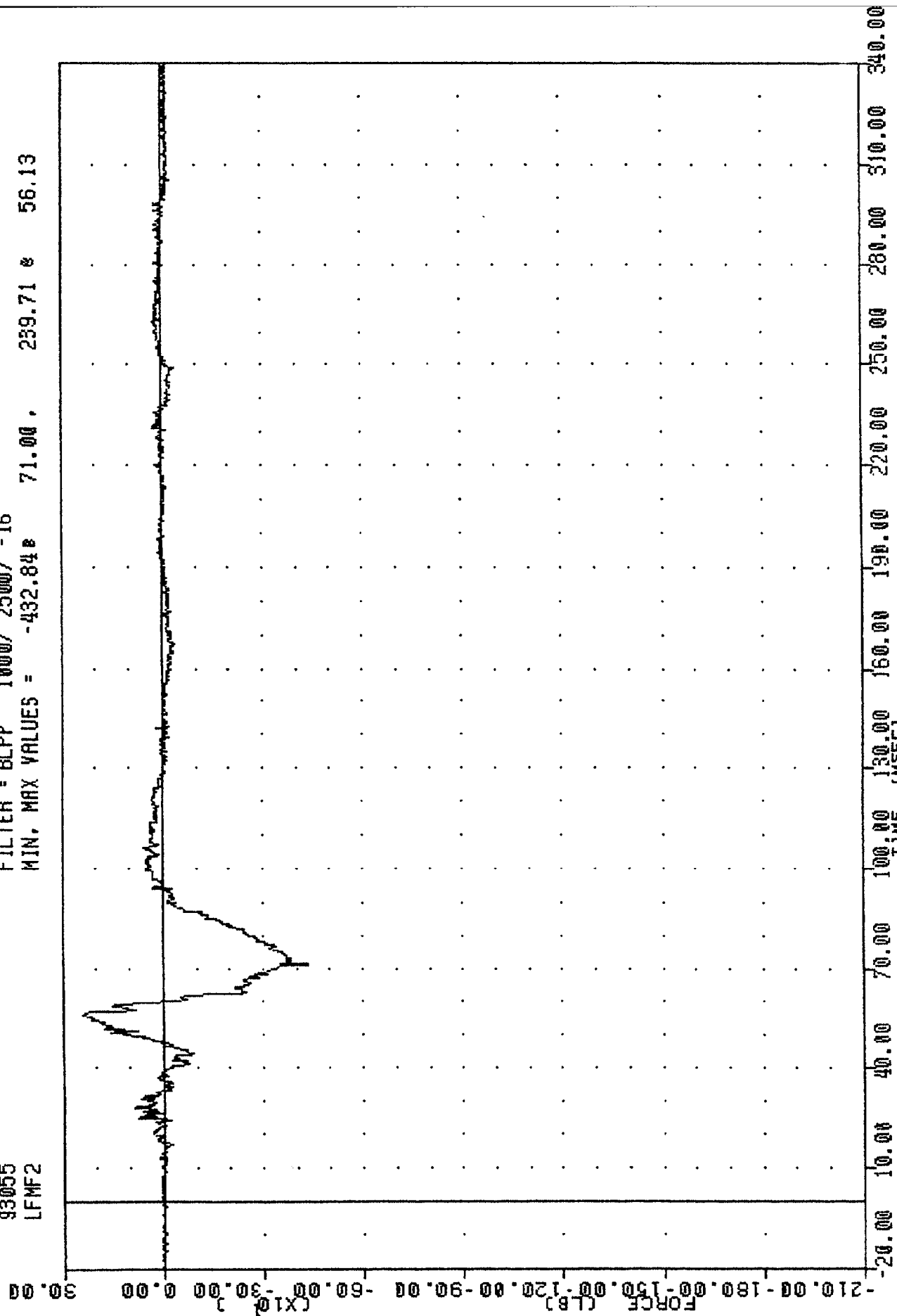
TRC , 930224
 200 COMPLIANCE TESTING
 93055
 CSTRG2

FILTER = BLPP 300/ 750/ -16
 MIN, MAX VALUES = 0.068 -20.00 , 34.64 e 57.75



TRC , 930224
 208 COMPLIANCE TESTING
 93055
 LFMF2

FILTER = BLPP 1000/ 2500/ -16
 MIN, MAX VALUES = -432.848 71.00 , 239.71 & 56.13

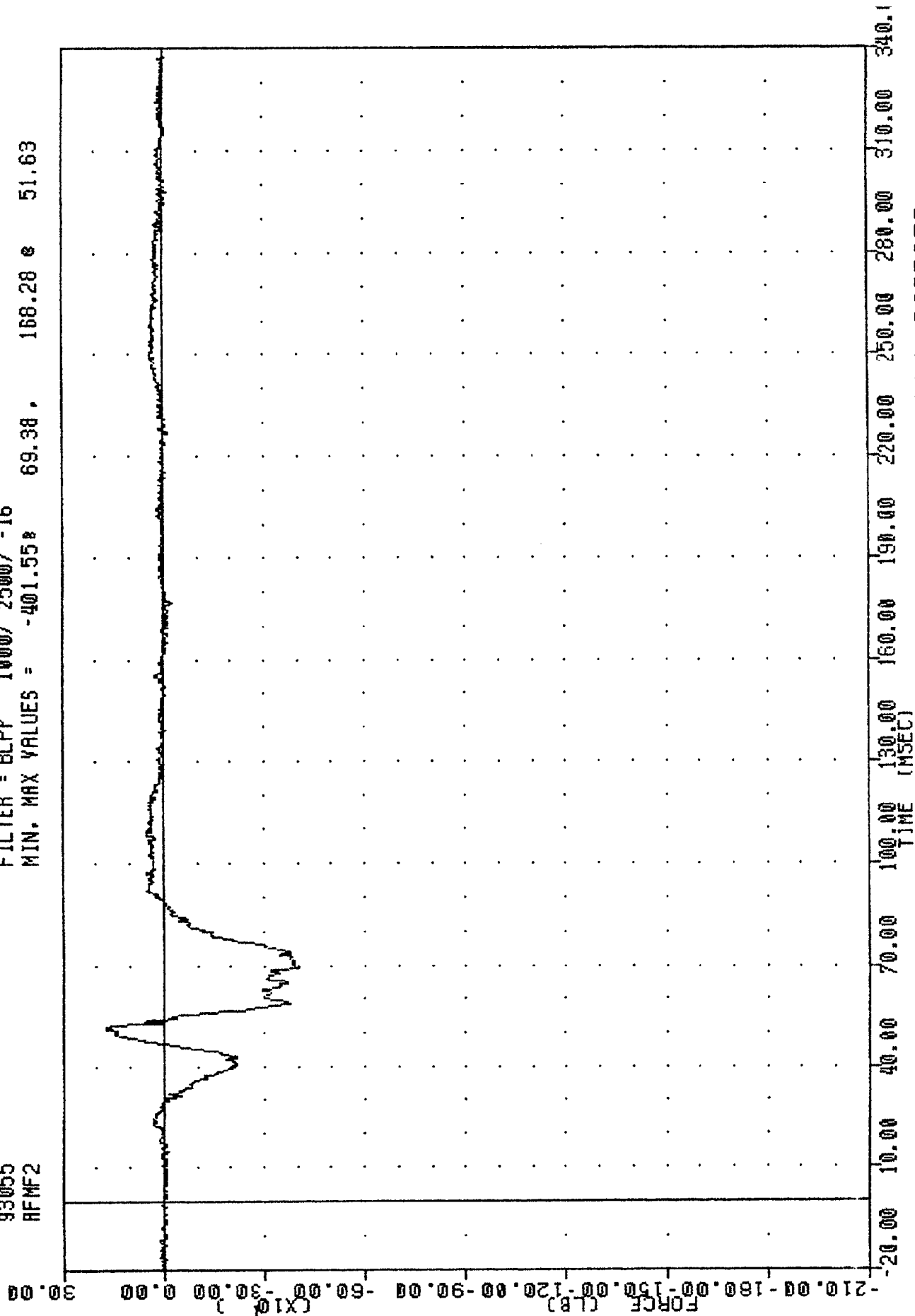


1993 TOYOTA T100 PICKUP INTO FLAT FRONTAL BARRIER

CRASH FROM PASSENGER LEFT REAR CORNER

TRC
 930224
 200 COMPLIANCE TESTING
 93055
 RFMF2

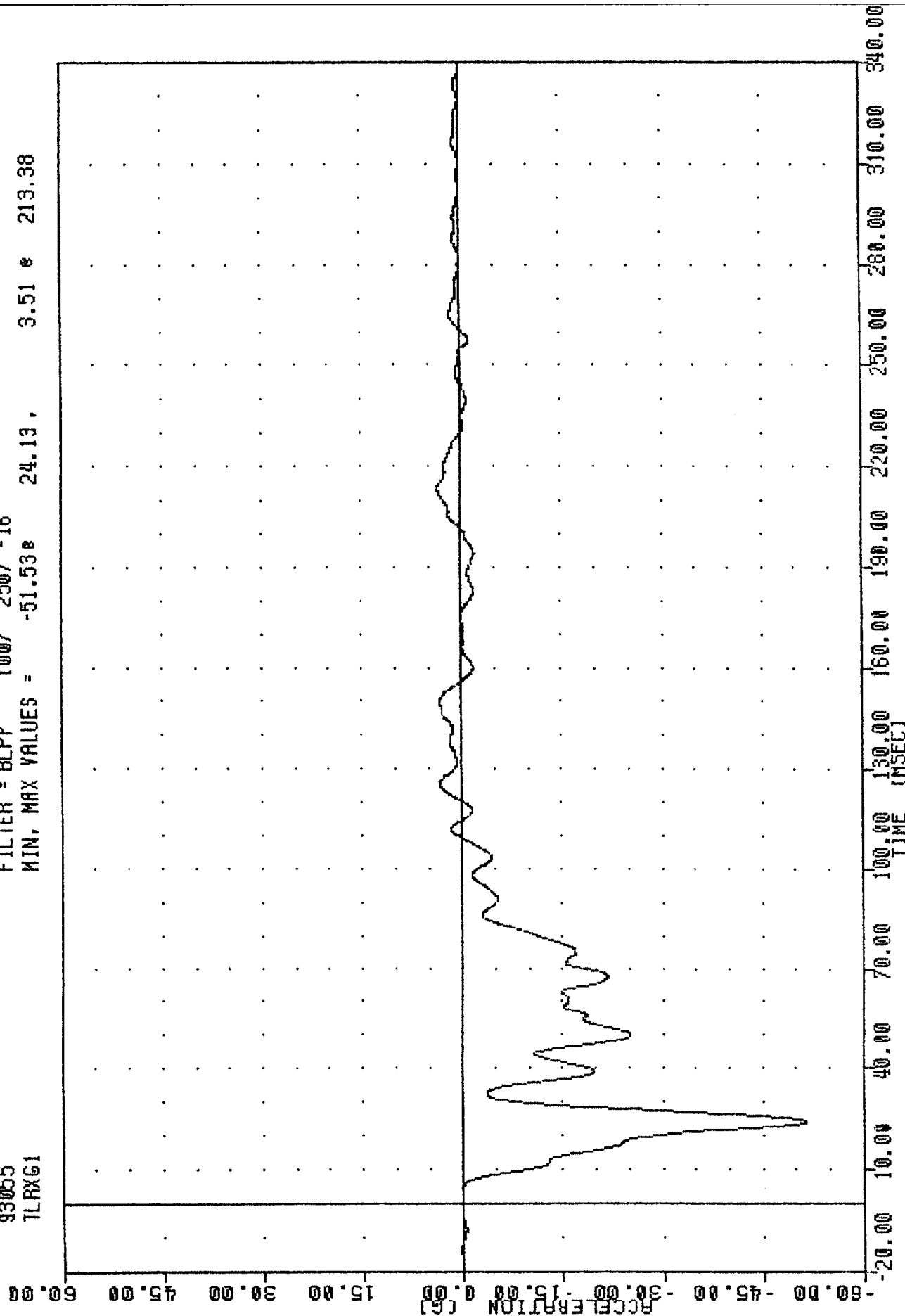
FILTER = BLPP 1000/ 2500/ -16
 MIN. MAX VALUES = -401.55 69.38 168.28 51.63



1993 TOYOTA T100 PICKUP INTO FLAT FRONTAL BARRIER
 RIGHT FRONT PASSENGER RIGHT FEMUR FORCE

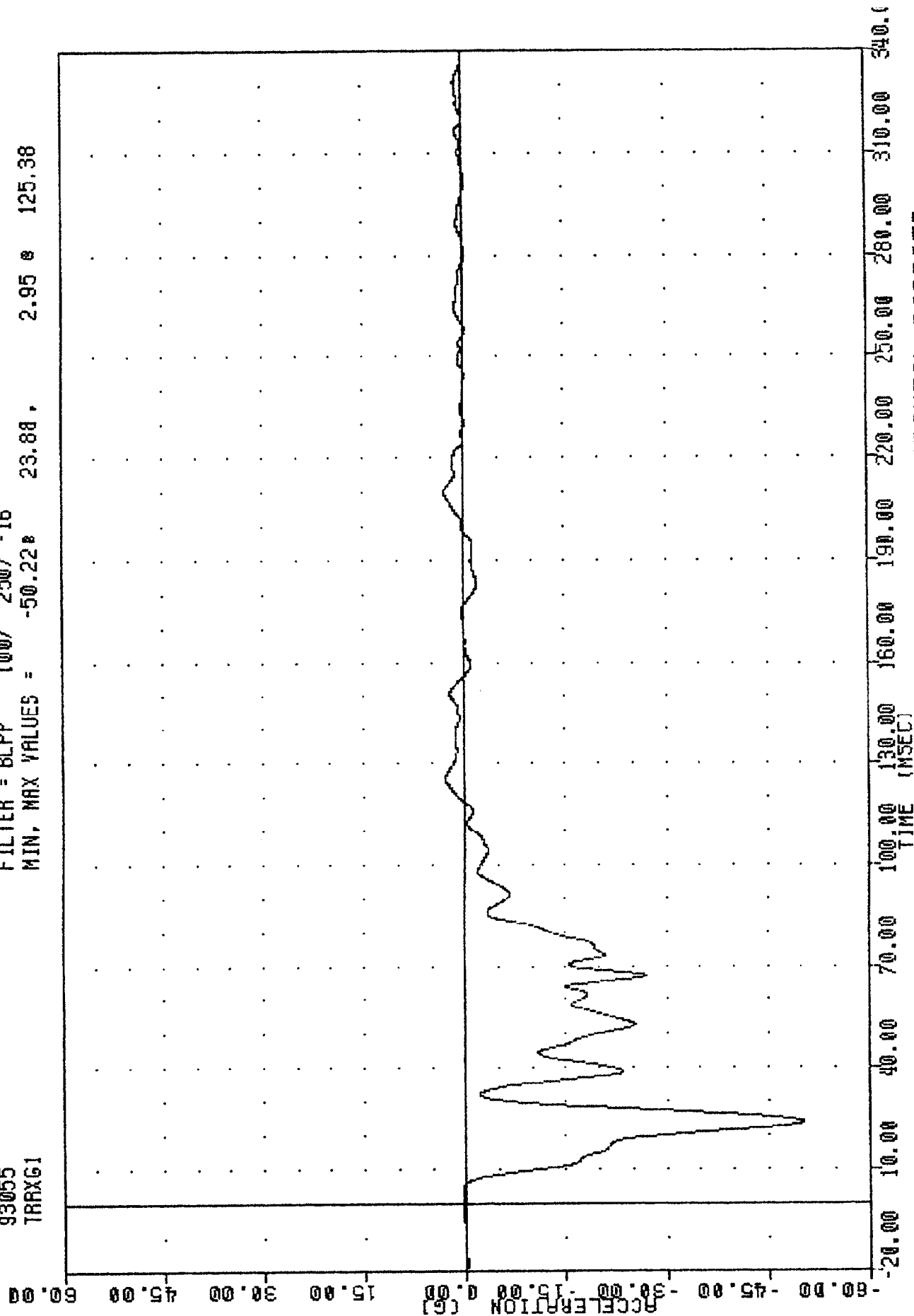
TRC , 930224
200 COMPLIANCE TESTING
93055
TLRXG1

FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -51.53e 24.13, 3.51 e 213.38



TRC , 930224
208 COMPLIANCE TESTING
93055
TRRXG1

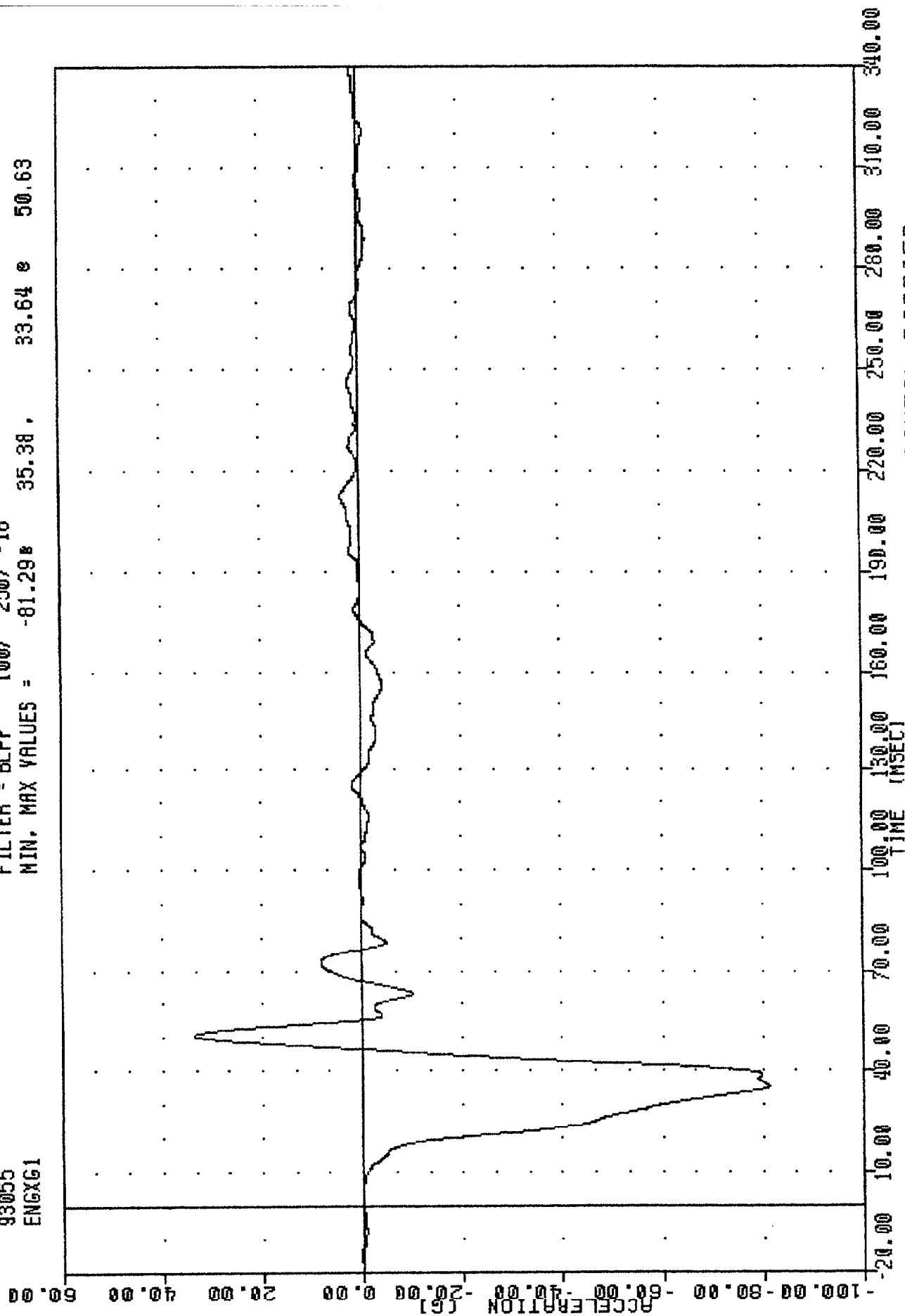
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -50.22 23.88 2.95 125.38



1993 TOYOTA T100 PICKUP INTO FLAT FRONTAL BARRIER
RIGHT REAR SEAT X-AXIS ACCELERATION

TRC 930224
208 COMPLIANCE TESTING
93055
ENGXG1

FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -81.29 35.38 33.64 50.63



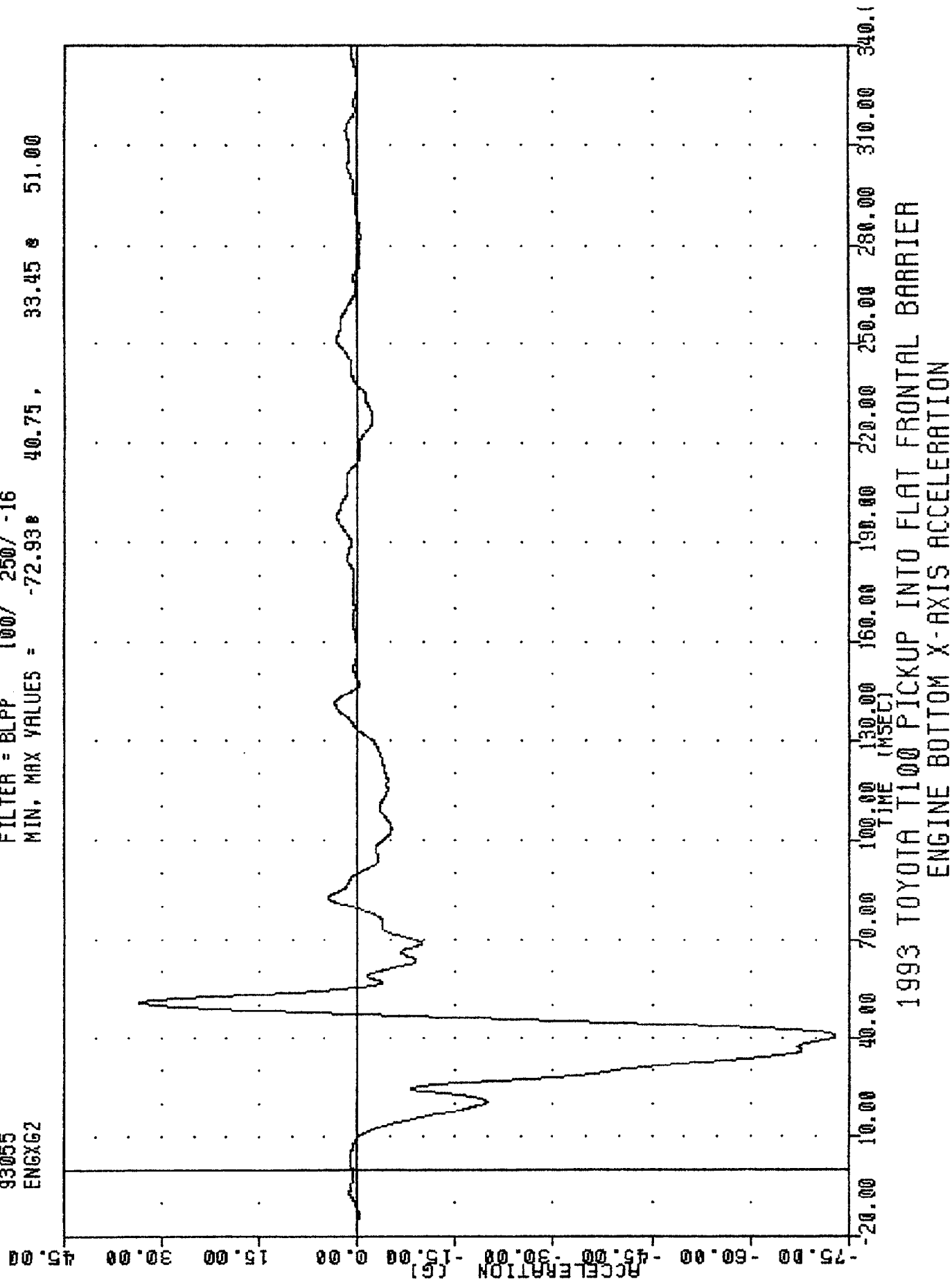
1993 TOYOTA T100 PICKUP INTO FLAT FRONTAL BARRIER

ENGINE SUPPORT AXLE ACCELERATION

TRC
208 COMPLIANCE TESTING
93055
ENGXG2

930224

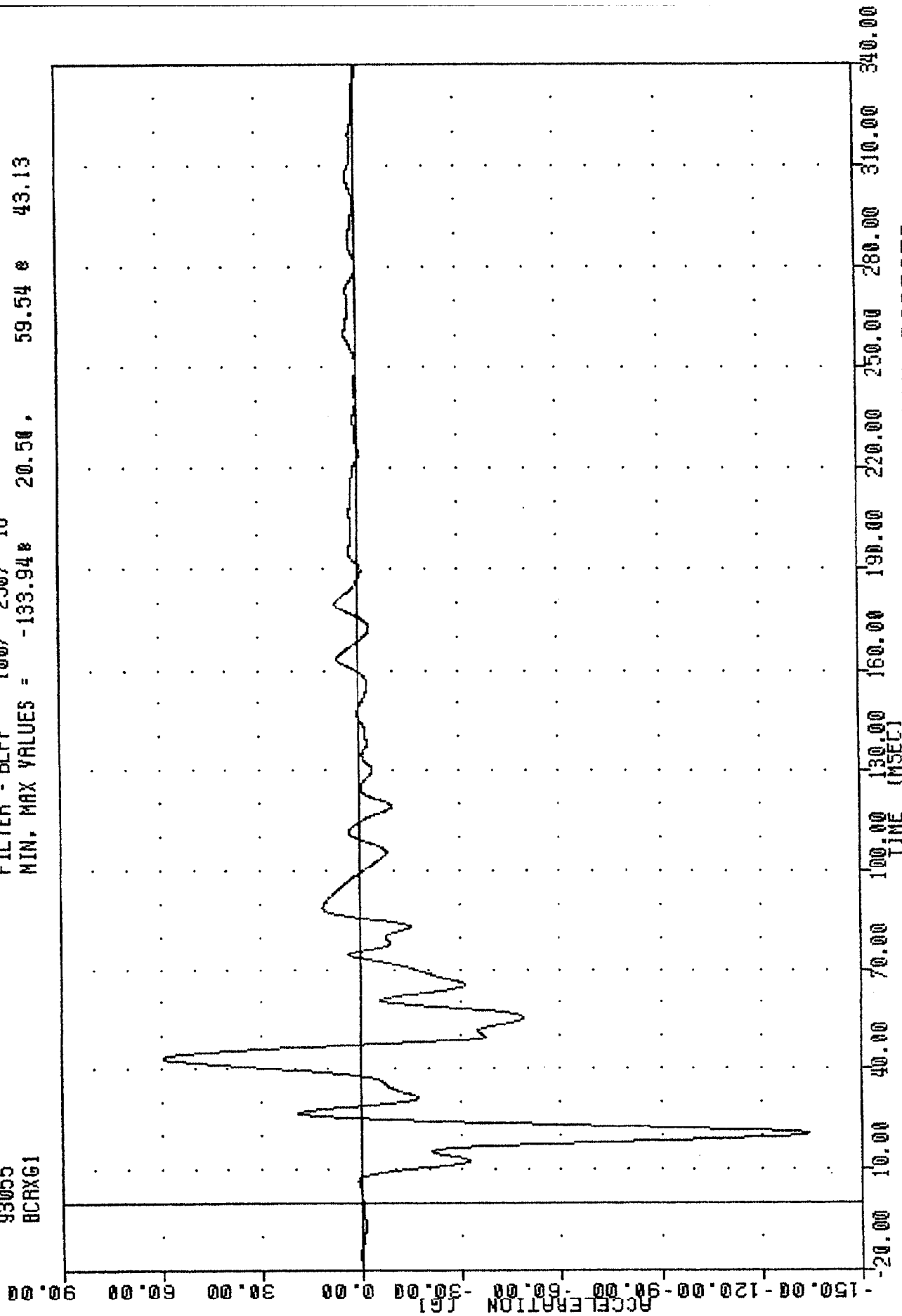
FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -72.93 40.75 33.45 51.00



1993 TOYOTA T100 PICKUP INTO FLAT FRONTAL BARRIER
ENGINE BOTTOM X-AXIS ACCELERATION

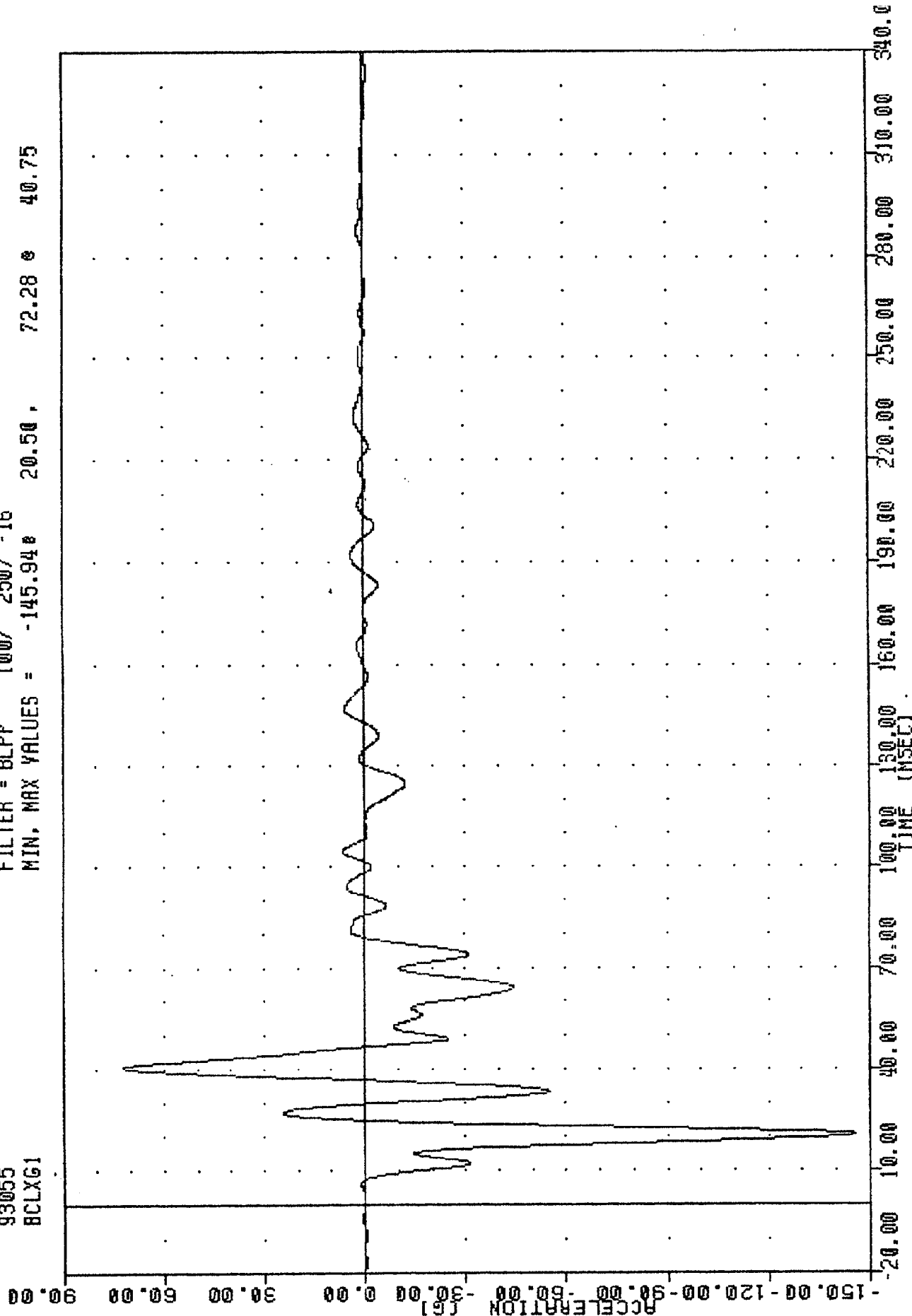
TRC , 930224
200 COMPLIANCE TESTING
93055
BCRXG1

FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -133.94 20.50, 59.54 43.13



TRC
208 COMPLIANCE TESTING
93055
BCLXG1

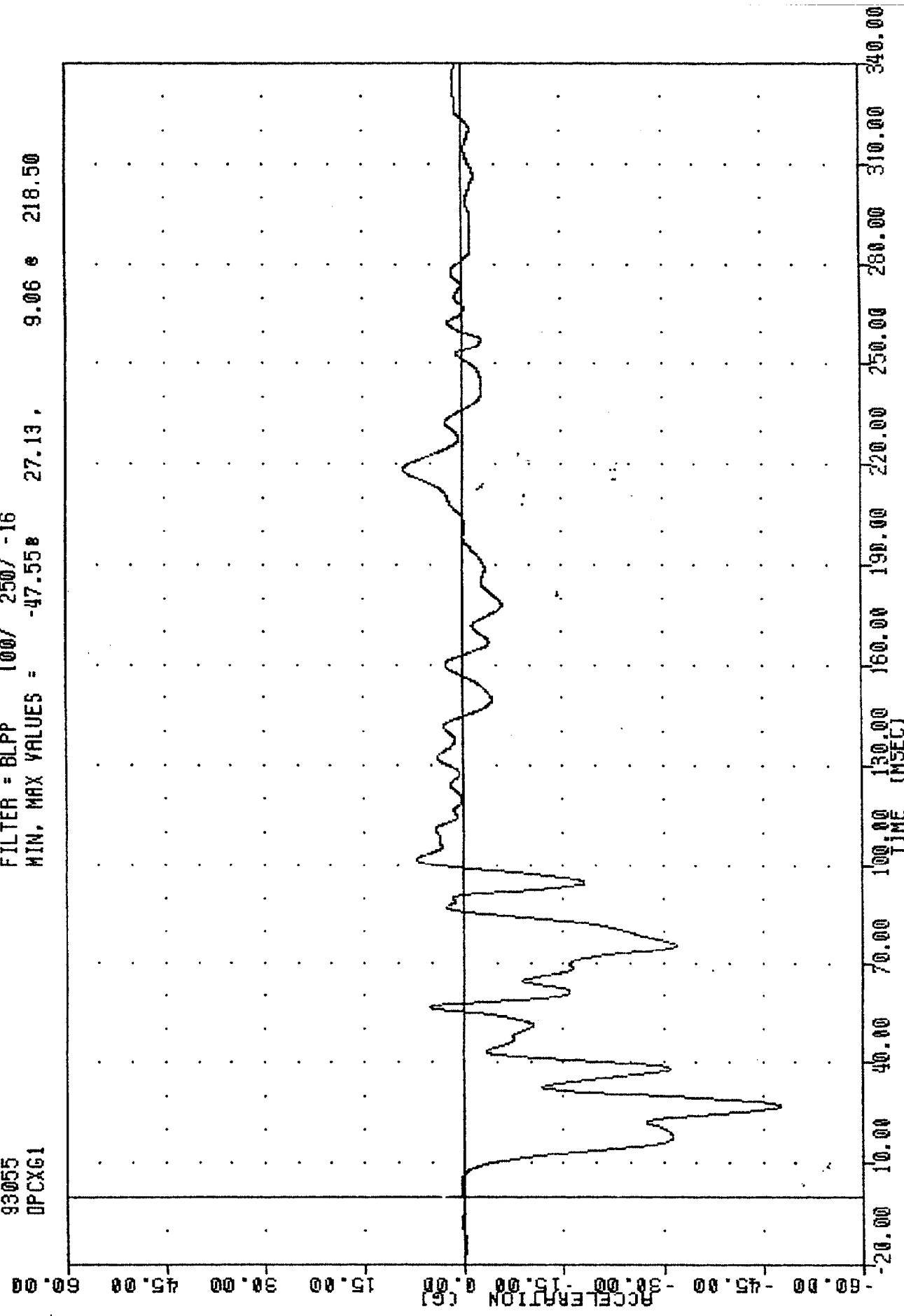
FILTER = BLPP 100/ 250/ -16
MIN. MAX VALUES = -145.94 20.50 72.28 40.75



1993 TOYOTA T100 PICKUP INTO FLAT FRONTAL BARRIER
LEFT BRAKE CALIPER X-AXIS ACCELERATION

TRC , 930224
 200 COMPLIANCE TESTING
 93055
 0PCXG1

FILTER = BLPP 100/ 250/ -16
 MIN, MAX VALUES = -47.55 27.13, 9.06 218.50



1993 TOYOTA T100 PICKUP INTO FLAT FRONTAL BARRIER
 INSTRUMENT PANEL CENTER X-Axis Acceleration